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THE UNIVERSITY OF ALBERTA

PERCEIVED VULNERABILITY AS AN EXPLANATION OF FEAR OF CRIME

by

KIM DON

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTERS OF ARTS

DEPARTMENT OF SOCIOLOGY

EDMONTON, ALBERTA

SPRING 1989

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled PERCEIVED VULNERABILITY AS AN EXPLANATION OF FEAR OF CRIME submitted by KIM DON in partial fulfilment of the requirements for the degree of MASTERS OF ARTS.

Michael W. Gillespie

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Date April 25, 1989

ABSTRACT

This study attempts to determine whether perceived vulnerability explains fear of crime. According to the literature, women and the elderly are fearful of crime since they view themselves as being more vulnerable to attack. Blacks and poorer respondents also are more vulnerable to crime since they reside in high crime neighbourhoods.

While the vulnerability argument is logical, it has not yet been adequately tested. Often demographic variables are used as measures of vulnerability. The use of demographic variables only begs the question of the vulnerability thesis. What is required are measures of vulnerability that capture differences in vulnerability to criminal victimization between the different demographic categories.

Two measures of perceived vulnerability, perceived risk and perceived seriousness, were added to Skogan and Maxfield's model of fear of crime. The addition of these two variables would allow us to test the vulnerability thesis, and thus, would provide a causal explanation as to why certain groups are fearful of crime. According to this revised model, certain groups would be fearful of crime since they perceive greater risk and/or more severe consequences of victimization.

Overall, the analysis reveals partial support for the vulnerability thesis. Measures of perceived vulnerability account for some of the fear experienced by women, blacks, and the poor. However, these measures failed to capture most

of the fear expressed by these fearful groups. Both measures of perceived vulnerability failed to explain any of the sex difference in fear.

With the exception of women, measures of neighbourhood characteristics account for a substantial proportion of fear experienced by the more fearful groups. The poor were more fearful since they perceive more crime and social disorder in their neighbourhood. Fear of crime among blacks and whites is situation specific. Blacks tend to be more fearful in low crime neighbourhoods, but are less fearful than whites in high crime neighbourhoods. The elderly were fearful since they perceived more social disorder in their neighbourhood. Individuals with access to crime information were fearful since they perceive greater risk and perceive more crime and social disorder in their neighbourhoods.

The significance of sex and neighbourhood characteristics in the final model points to the need for further work to determine the process by which people become more fearful of crime. The fact that the model fails to explain the sex difference in fear suggests that fear of crime among women differs significantly from other fearful groups. This indicates that researchers may have to look towards developing a separate model to explain the sex difference in fear. The significance of neighbourhood indicators suggest that more work needs to be done to explore how people develop their impressions of the environment.

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I. Introduction

Findings from a series of polls reveal that fear of crime is a salient social problem (Gomme, 1986; Baumer, 1978; Liska, 1982; Lewis and Salem, 1986). In the United States fear of crime rose between 1965 and the mid-1970s but has remained stable at a considerably high level (Taylor and Hale, 1986; Skogan and Maxfield, 1981; Baumer, 1978; Riger et. al., 1978; Tossland, 1982). National polls have shown that 40 to 50% of the American population were fearful of being out alone at night (Lewis and Maxfield, 1981; Tossland, 1982). Such findings suggest that fear of crime may be a social problem as serious as that posed by crime itself (Gomme, 1986; McPherson, 1978).

Although there is consensus in the literature that fear of crime is a serious social problem, little is known concerning why certain groups within the population are fearful of crime. Popular notions of crime would suggest that those groups more likely to be victimized would be more fearful. This argument has received some support in the literature since blacks and low income respondents are more fearful than whites and higher income respondents and are more likely to be victimized. However, research evidence also shows that certain groups have high fear but low rates of victimization. Compared to their counterparts, women and the elderly are more fearful despite their lower levels of victimization. These findings have been consistently reported in both American and Canadian research (Muir, 1987;

Gomme, 1986).

The paradox between low victimization rates and high fear suggests that fear of crime may be influenced by factors other than crime rates and victimization rates. Recent studies have suggested that anxiety about crime may be influenced by assessments of vulnerability (Skogan and Maxfield, 1981; Maxfield, 1984; Muir, 1987). Women and the elderly may be more fearful since they view themselves as being more vulnerable to attack. The vulnerability argument provides an explanation of why fear may be high for both victimized and non-victimized groups.

The goal of this research project is to assess the plausibility of the vulnerability thesis using data from the Citizen Participation and Community Crime Prevention 1979: Chicago Metropolitan Area Survey.[1] Data were available for many of the key determinants of fear. For the purposes of this study, sex, age, race and income are used as exogeneous controls. Past studies which have assessed the accuracy of the vulnerability argument have treated demographic variables (age, sex, race and income) as measures of vulnerability. More recent studies have concentrated solely on assessing fear of crime among select populations such as women, the elderly, and victims of crime. However, by focusing on certain groups such as the elderly, researchers

---

[1] The collectors of this data are Paul J. Lavrakas and Wesley G. Skogan. This survey was made available by the Inter-University Consortium for Political and Social Research. Both the Consortium and the collectors of this survey do not bear responsibility for the analysis or interpretations presented in this thesis.

are only able to explain why some elderly residents are more fearful. The inclusion of other reference groups and key determinants of fear would allow an explanation as to why fear of victimization may be higher for this group.

One of the strengths of this dataset is that variables relating to environmental conditions are available at the neighbourhood level. As demonstrated by Skogan and Maxfield (1981), there is more variability in fear within a city than between different cities. Many studies made comparisons in fear by using city-level data (Skogan and Maxfield, 1981; Lewis and Maxfield, 1980; Muir, 1987), but to fully understand fear of crime would require that it be studied within a neighbourhood context. More recent studies that have used neighbourhood-level data have found that fear varies across different neighbourhoods within the same city (Skogan and Maxfield, 1981; Lewis and Maxfield, 1980; Yin, 1985). The use of neighbourhood specific characteristics would allow us to capture how neighbourhood conditions shape perceptions of vulnerability and fear. This information would be lost if city-level data were used.

The theoretical model adopted for this research project is the Cognitive and Volitional Model developed by Skogan and Maxfield (1981). Although other models of fear of crime have been developed, Skogan and Maxfield's model was chosen since it includes the key determinants of fear, and has received some support in the literature (Skogan and Maxfield, 1981; Baumer, 1985). The model suggests that fear

of crime may be a rational response to the perceived threat of harm. Individuals most vulnerable to fear are those that perceive themselves as being physically and socially vulnerable to attack, perceive their neighbourhoods as dangerous and have been victimized or know acquaintances or relatives who were victims.

To improve upon the model, I propose to add measures of perceived vulnerability that would capture differences in fear among the more fearful groups. These measures of vulnerability would act as intervening variables to explain why women, the elderly, blacks and the poor are more fearful of crime, and would also provide a causal explanation as to why residents of high crime neighbourhoods and those with access to crime information are more fearful. The main research question addressed in this project is: Does perceived vulnerability account for fear of crime among the more fearful groups?

A. Thesis Outline

In order to properly assess the vulnerability argument, it is necessary to review literature on this issue. In Chapter Two, I provide a more thorough description of Skogan and Maxfield's model and review empirical and theoretical work to determine if research supports the basic assumptions of this model. On the basis of this review, I argue that past measures of vulnerability are deficient and that measures of perceived risk and perceived consequences of

victimization may qualify as more appropriate measures of perceived vulnerability. Using such measures would allow a proper test of the vulnerability argument.

Chapter Three describes the data and methods used in this study. The empirical analysis uses data from the Chicago Metropolitan Area Survey. This survey contains data from a sample of 1,803 residents from 76 different neighbourhoods in Chicago. As with any secondary data analysis, this project is limited by the design and goals of the original researchers. While the intent of this project is to assess the logic of the vulnerability argument, the survey was conducted for the purpose of evaluating the process that lead respondents to employ precautionary measures. However, despite this difference in focus, this survey contains the relevant variables needed for a test of the vulnerability argument, in particular measures of perceived vulnerability.

Chapters Four and Five present the results of the data analysis. Chapter Four provides a test of the Cognitive and Volitional Model to determine whether knowledge of criminal events and neighbourhood characteristics account for fear of crime among women, the elderly, blacks and the poor. Chapter Five presents findings on whether perceptions of vulnerability explains the fear of these groups. If the vulnerability argument holds, these groups should be fearful of crime since they perceive higher risk and more severe consequences of victimization.

In the final chapter, the empirical results are summarized and conclusions are reached on whether the vulnerability argument is supported by the data. As a final step, I will discuss the limitations of this study, and suggest how this study may benefit future research.

II. LITERATURE REVIEW

A. Introduction

Fear of crime has been an important research topic since the 1960s (Baumer, 1978; Yin, 1980, 1982; Liska, 1982; Gomme, 1986; Lewis and Salem, 1986). Interest in studying fear of crime arose from the finding that more people are fearful of crime than report being victimized (Baumer, 1978; Skogan and Maxfield, 1981; Tossland, 1982; Maxfield, 1984). Certain groups report greater fear despite their lower levels of victimization. Although men are more likely to be victimized, women consistently report greater fear (Riger et al., 1978, 1982; Riger, 1982; Skogan and Maxfield, 1981; Tossland, 1982; Warr, 1984, 1985). Similarly, age and victimization are inversely related, but the elderly are more fearful of crime (Jaycox, 1978; Giles-Sims, 1984; Yin, 1980, 1985; Eve and Eve, 1985; Kennedy and Silverman, 1985; Baldassare, 1986; Akers et al., 1987).

On the basis of these findings, researchers sought to explain why the elderly and women are more fearful of crime. Earlier researchers argued that fear may be an irrational response to exaggerated media portrayals (Mugford, 1984; Lewis and Salem, 1986). This position has been criticized on the grounds that the perceived threat of victimization can be just as fear provoking as the actual experience of becoming a victim (Baumer, 1978; Skogan and Maxfield, 1981). Women and the elderly may be more fearful of crime since

they view themselves as being more vulnerable to attack (Riger et al., 1978; Gordon et al., 1980; Skogan and Maxfield, 1981; Baumer, 1985).

Although the vulnerability thesis appears plausible, it has not yet been adequately tested. This chapter will assess research findings on the vulnerability thesis, and will provide suggestions on how research in this area can be improved. This review will be divided into two sections. I begin by presenting the conceptual framework of Skogan and Maxfield's Cognitive and Volitional Model and will review research findings to determine if this model has been supported in the literature. In the second section of this chapter, I argue that although Skogan and Maxfield included the key determinants of fear in their model, their failure to provide measures of perceived vulnerability seriously weaken their test of the vulnerability hypothesis. By adding measures of perceived risk and perceived seriousness to the model, I hope to strengthen the test of the vulnerability argument.

B. The Cognitive and Volitional Model

Skogan and Maxfield (1981) used the vulnerability argument to develop a general model of fear of crime. A revised version of this model is shown in Figure 1. This model can be separated into three main components: (1) demographic variables which are used as measures of vulnerability, (2) environmental conditions, and (3)

knowledge of criminal events.

The Cognitive and Volitional Model

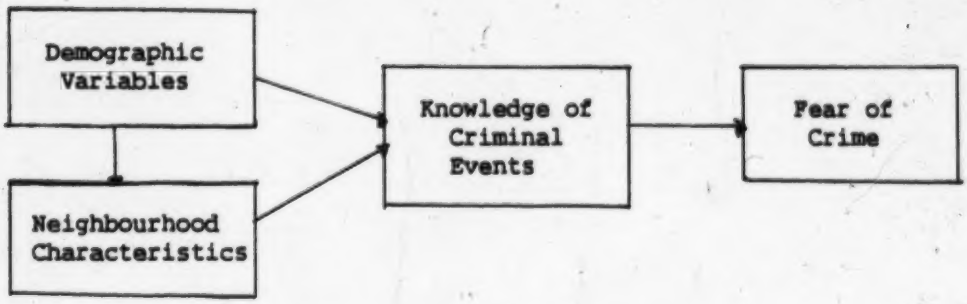

Figure 1

1. Demographic Variables as Measures of Vulnerability

Skogan and Maxfield (1981) treat sex, age, race, and income as measures of both physical and social vulnerabilities. Women and the elderly are physically vulnerable to attack since they are unable to defend themselves if they are attacked by the most common offender, young males. In addition, income and race represent differences in social vulnerabilities. Blacks and the poor are at higher risk since they reside in high crime neighbourhoods. Being concentrated in the lower income bracket, these groups also lack the resources to deal with the consequences of their victimization. Individuals with higher incomes often are better able to bear the financial burden of property losses and medical treatment, have more effective support systems, and have better psychological resources

in handling the trauma of victimization.

Most studies which have taken sex, age, race and income into account generally report that the effects of these variables are additive (Skogan and Maxfield, 1981). However, there has been some indication that these demographic variables may not be independent predictors of fear. Ortega and Myles (1987) reported that race interacted with both age and sex to generate fear. Baldassare (1986) reported that age combines with income to produce fear. The low income elderly have more fear than any other income group, but the high income elderly were less fearful than their younger counterparts. However, these researchers performed multiple regression analysis using a dummy dependent variable, and thus, the results of these studies are highly suspect (Gillespie, 1977). Baumer (1985) found significant interaction between age and gender. Women were fearful regardless of age, whereas fear tends to increase with age for men. Such results suggest that further research should be conducted to determine if age, sex, race and income interact with each other to produce fear.

2. Neighbourhood characteristics

Neighbourhood conditions have been described as the most important predictor of fear (Ward et. al., 1986). Relevant variables used in past studies include

contexual characteristics of the environment, perceptions of the neighbourhood and social integration. Contexual variables such as unemployment rates (Sampson, 1985), the racial composition of the neighbourhood (Gordon et. al., 1980; Taub et. al., 1981; Ward et. al., 1986; Stinchcombe, 1980), density (Sampson, 1985), and crime rates have all been linked to fear. Of all contexual variables, crime rates have received the most support at both the city and neighbourhood levels.[2] The effect of these contexual variables are indirect and these variables are more likely to influence fear through individual perceptions of environmental conditions. Studies have shown that individuals have accurate perceptions of the crime problem in the neighbourhood (Skogan and Maxfield, 1981; McPherson, 1978; Jaycox, 1978). Several researchers have even suggested that these perceptions of crime are so accurate that these measures can be used in place of the official crime rate (McPherson, 1978; Skogan and Maxfield, 1981). While there is considerable support for the inclusion of crime related measures in the study of fear, Lewis and Maxfield (1980) suggested that perceptions of social disorder in the neighbourhood are also important predictors of fear. Indicators of social

---

[2]Studies which have linked city crime rates to fear include Krahn and Kennedy (1985), Warr (1980, 1982), and Skogan and Maxfield, (1981). For studies that link neighbourhood crime rates with fear see Maxfield (1984), Lewis and Maxfield (1980), Skogan and Maxfield (1981), McPherson (1978), and Jaycox (1978).

disorder in the community include the presence of graffiti, abandoned and burnt buildings, and teens hanging out in the streets. People who perceive social disorder as being problematic often view their neighbourhoods as being dangerous, and thus, are more fearful (Lewis and Maxfield, 1980; Skogan and Maxfield, 1981; Maxfield, 1984; Lewis and Salem, 1986). Finally, a lack of social integration has been found to be linked to fear of crime, but it is still not clear whether this is a cause or consequence of fear (Hartnagel, 1979).

Addressing fear of crime as a function of environmental factors encourages us to consider neighbourhood characteristics which shape people's perceptions of vulnerability. Studies which have employed both individual characteristics (sex, age, race, and income) and neighbourhood characteristics often reported that environmental factors play an important role in determining fear (Lewis and Maxfield, 1980; Skogan and Maxfield, 1981; Ward et. al., 1986). Official crime rates have been found to parallel those of fear. Even when demographic variables are controlled, those who live in high crime neighbourhoods are more fearful (Jaycox, 1978; Baumer, 1979; Skogan and Maxfield, 1981). However, there has been evidence to suggest that the effects of sex and age may vary across neighbourhoods. Baumer (1979) suggested that under conditions of moderate crime rates, males and females

are equally fearful. Maxfield (1984) reported that in high crime neighbourhoods, older people are not more fearful than younger people. In neighbourhoods where crime is not considered a problem, age is an important predictor of fear. The relationship between race and income, however, appear to be more consistent. When neighbourhood characteristics are controlled for, race and income are usually no longer significant (Baumer, 1978). This suggests that neighbourhood characteristics may be an important intervening variable in the relationships between the demographic variables and fear.

3. Knowledge of Criminal Events

Skogan and Maxfield (1981) report that knowledge of criminal events plays a very limited role in explaining fear of crime. One common sense assumption is that victims should be more fearful than non-victims. However, findings from past studies on victimization experiences have been mixed with only a handful of studies reporting significant relationships between victimization and fear (Akers et. al., 1987; Skogan, 1987; Gomme, 1986; Skogan and Maxfield, 1981; Garofolo, 1978; Baldassare, 1986; Jaycox, 1978). Since very few people are victims of a crime, many people learn about crime from other sources. Two main sources of information are the media, and personal contact with

friends, relatives and acquaintances. Recent studies have indicated that the media does not influence fear within the respondent's own neighbourhood (Gomme, 1986; Muir, 1987; Skogan and Maxfield, 1981). Informal community networks have been found to play a more dominant role in determining fear. People who witnessed a crime or have been victimized send out shock waves through the community by passing crime information through social networks. In urban neighbourhoods, individuals with friends or acquaintances who had been victimized are more likely to be fearful of crime than those without such acquaintances (Skogan and Maxfield, 1981).

Knowledge of criminal events cannot account for the greater fear experienced by women and the elderly. Compared to men and younger respondents, women and the elderly are least likely to be victimized, but are more fearful. In studies which employed multivariate analysis, socioeconomic variables (sex, age, race and income) and neighbourhood characteristics are often found to be much stronger predictors of fear. However, there has been some indication that crime information obtained from social networks may actually explain some of the fear experienced by the two groups. Research evidence suggests that people tend to be afraid of crime which affects people like themselves (Shotland, 1979; Skogan and Maxfield, 1981). Stories that are circulated

through communication networks are more likely to be about women and the elderly (Muir, 1987; Skogan and Maxfield, 1981; Riger, 1981). This may partially explain why fear of crime among these two groups is higher.

Other explanations for the weak relationships reported by studies which have explored the effects of knowledge of criminal events on fear may be the failure to control for either the type of offense or for the geographic proximity of the crime involved. As suggested by several studies of victimization experiences, personal offenses contribute more to fear (Skogan, 1987; Maxfield, 1984; Skogan and Maxfield, 1981). However, in several studies which have controlled for the type of offense involved, those who knew of a burglary incident were more fearful than those with knowledge of a personal offense (Skogan, 1987; Skogan and Maxfield, 1981). Several reasons could account for this finding. First, compared to personal crimes, burglaries occur more often. Second, the stronger effect of burglary information may also be due to the geographic proximity of the offense. People are more likely to have knowledge of a burglary that has occurred in their own neighbourhood than in other parts of the city (Skogan and Maxfield, 1981). Personal victimizations are more dispersed throughout the city. People tend to be more fearful of crime, especially when it occurs within their own neighbourhood (Muir, 1987; Maxfield and Skogan,

1981). When people are aware of crime that occurs in other parts of the city, fear and knowledge of crime are inversely related. Maxfield and Skogan (1981) reported that people who have access to crime information that has occurred elsewhere in the city tend to be less fearful.

In sum, Skogan and Maxfield (1981) developed a comprehensive model of fear of crime that includes the major determinants of fear. By including knowledge of criminal events and environmental factors in the model, the researchers have considered how these variables may shape perceptions of vulnerability. According to the model, fear of crime is viewed as a rational response to the perceived threat of victimization. People who have been victimized or know of acquaintances who were victims, or live in neighbourhoods that they perceive as dangerous are more likely to view themselves as being more vulnerable to attack and thus, are more likely to be fearful of crime.

C. Criticisms of the Model

Although Skogan and Maxfield (1981) developed a comprehensive model of fear of crime, the manner in which these researchers chose to operationalize measures of vulnerability compromised their test of the vulnerability thesis. By treating the demographic variables (age, sex, race and income) as measures of vulnerability, Skogan and Maxfield (1981) beg the question of the vulnerability

thesis. It is possible that some mechanism other than a sense of vulnerability intervenes in the relationship between these variables and fear of crime. The reason for this is that the demographic variables capture differences in socialization and lifestyles, as well as the proposed differences in vulnerability. It may be these differences, rather than differences in vulnerability which produce differences in fear of crime. What is needed is to move from the "hypothetical construct" of vulnerability to direct measures of this construct.

Some work has been done to introduce other measures of vulnerability in the study of fear of crime. Health measures have been used to represent physical vulnerabilities and have been reported to be significantly related to fear among the elderly (AKers et. al., 1987; Gomme, 1986; Baldassare, 1986; Yin, 1981, 1985; Eve and Eve, 1984). Social support networks have also been linked to fear, but this relationship also appears to be more applicable to the elderly (AKers et. al., 1987; Eve, 1985; Kennedy and Silverman, 1985; Tossland, 1982; Ward et. al., 1986) than to women (Mugford, 1981). Riger et. al. (1978) introduced a measure of physical vulnerability that was designed to capture sex differences. This measure of physical vulnerability was operationalized by asking respondents to assess their strength and speed relative to the average man and woman. Compared to men, women were more likely to see themselves as being slower and weaker. This measure of

perceived vulnerability was also found to be correlated with fear.

The results of these studies suggest that vulnerability is an important concept in the study of fear of crime. However, researchers in operationalizing vulnerability seem to suggest that vulnerability is a concept that is generalizable to all situations. This manner of operationalizing vulnerability may have precluded an adequate analysis of how vulnerability relates specifically to fear of crime. For instance, women may believe that they are smaller and weaker than the average man and women, but this does not necessarily mean that they perceive themselves as being more vulnerable to criminal victimization. This would partially explain why Riger et. al.(1981) found that their measure of perceived vulnerability accounted for only 4% of the variation in fear. Similarly, being in poor health does not necessarily mean that one will be more fearful of crime. Therefore, what is required is a measure of vulnerability that corresponds specifically to perceptions of vulnerability to criminal events. These measures should also be offense specific since there is evidence to suggest that the personal offenses are more fear provoking (Skogan and Maxfield, 1981; Riger et. al., 1978; Warr and Stafford, 1983; Warr, 1984, 1985). Moreover, fear of crime among women may be offense specific. Several researchers have suggested that women's fear of crime can be interpreted as the fear of rape (Riger et. al., 1978; Warr, 1984, 1985, 1987). When

property offenses are considered, women and men display similar levels of fear (Horton, 1987; Atkinson, 1979).

A set of crime related measures that may capture differences in perceived vulnerability is the perceived likelihood of being a victim of different crimes. Being offense specific, this set of measures would allow us to determine which crimes lead to both greater vulnerability and fear. This set of measures may also capture differences in physical vulnerability. If women and the elderly are more vulnerability to attack, we would expect that they would perceive greater risk of victimization. Whether these perceptions are congruent with reality is irrelevant, since it is perceptions of risk that are more likely to influence fear of crime (Yin, 1980). Measures of perceived risk can also be linked to social vulnerabilities. According to Skogan and Maxfield (1981), blacks and low income respondents are fearful since they reside in high crime neighbourhoods. While this linkage appears plausible, it is unlikely that these groups would become fearful unless they perceive high rates and realistically assess their probability of criminal victimization.

Support for the use of measures of perceived risk as a measure of perceived vulnerability can be found in the literature. Fear of crime has been found to be high if the probability of victimization is perceived as being high (Yin, 1980; Ortega and Myles, 1987; Giles-Sims, 1984; Riger et. al., 1978; Gordon, 1980; Maxfield, 1984; Lewis and

Maxfield, 1984). Moreover, measures of perceived risk also have been found to capture differences between sex, age, race and income groups. Compared to their counterparts, assessments of risk are greater among blacks (Ortega and Myles, 1987; Skogan, 1981), the poor (Skogan, 1981), women (Riger, 1978; Skogan, 1981), and the elderly (Ortega and Myles, 1987; Gilles-Sims, 1984; Skogan, 1981). Gilles-Sims (1984) reported that when measures of perceived risk are included, age, sex, race and income no longer are significant. Thus, based on these studies, it would appear that perceived risk may be an important intervening variable in the relationship between fear of crime and the demographic variables.

Research evidence also suggests that measures of perceived risk can also be related to knowledge of criminal events and environmental conditions. People with knowledge of criminal events have been found to be more fearful of crime and were more likely to perceive themselves at higher risk of criminal victimization (Taub et. al., 1981; Skogan, 1981). Assessments of risk have also been linked to the reality of environmental conditions. Individuals who reside in high crime neighbourhoods and perceive social disorder as being a problem are more likely to perceive themselves at higher risk of criminal victimization (Taub et. al., 1981; Skogan, 1981). It can be argued that those citizens who have knowledge of criminal events and/or assess their environment as being dangerous are more likely to perceive themselves as

being at higher risk of attack, and thus, become more fearful of crime.

Although we have established that perceived risk to criminal victimization may be an appropriate measure of perceived vulnerability, another important factor that has received very little attention in the literature is the perceived severity of the consequences of victimization. Thus far, no studies were found that have used this measure in the study of fear of crime. This is surprising, especially since many researchers have argued that the more vulnerable groups are more likely to suffer severe consequences if victimized. According to researchers, women are more likely to fear rape because this offense always holds the probability of serious physical injury and emotional damage (Skogan and Maxfield, 1981; Skogan, 1981; Riger et. al, 1981; Riger, 1981; Gordon et. al., 1980; Baumer, 1978). The elderly, being less agile are less likely to recover from physical injury if victimized (Yin, 1980, 1985; Eve, 1985). Being concentrated in the lower income bracket, the poor and blacks often cannot afford needed medical services and the cost of replacing stolen property as easily as those concentrated in the upper income bracket.

By including perceptions of the consequences of victimization we are able to determine whether these major assumptions have any validity in the study of fear of crime. While the consequences of victimization may be more severe for women, the elderly, blacks and the poor, these variables

are unlikely to effect fear of crime, unless these groups actually perceive the consequences as being more traumatic.

Including perceptual measures of the perceived consequences of victimization would also allow us to test the argument proposed by Skogan and Maxfield on how environmental conditions affect fear of crime. According to the model, respondents in high crime neighbourhoods are more fearful of crime. However, residents of these neighbourhoods are often concentrated in the lower classes and are black. Thus, similar to the argument proposed for groups that are socially vulnerable to attack, we would expect that the perceived consequences of victimization should be more severe for those residing in high crime neighbourhoods.

The inclusion of measures of the perceived consequences of victimization would also clarify how victimization experiences affect fear of crime. In a recent study Skogan (1987) suggested that researchers may have misspecified the relationship between the consequences of victimization and fear. Often researchers assume that women, the elderly, blacks and the poor are more likely to suffer severe consequences if victimized. However, in his study, Skogan (1987) reported that victims were more fearful than nonvictims, regardless of age, sex, race or income differences. He concludes that the consequences of victimization are no more severe for women, the elderly, blacks, and the poor. Compared to non-victims, victims are more fearful since the impact of victimization is shared

equally by all groups.

Because Skogan does not include measures of the perceived consequences of victimization, the argument presented is highly questionable. Two explanations are possible as to why victims are more fearful than non-victims. First, victims may become more fearful than non-victims because they perceive greater risk of future victimization. However, it is also possible that the conclusion reached by Skogan is valid. Victims may be more fearful since they view the consequences of future victimization as being more severe. Unless measures of perceived risk and perceived consequences of victimization are included, it is difficult to determine how victimization may lead to greater fear. If such measures are introduced to the model, this would clarify whether perceived risk and/or perceived consequences generates fear of crime among victims.

Measures of perceived seriousness would also explain how knowledge of other victims may effect fear of crime. Under Skogan and Maxfield's model, people who hear about crime will vicariously experience the incident and thus, become more fearful. These researchers suggest that victims and non-victims are affected in a similar manner by crime information. Thus, we would expect that those with knowledge of victims and those victimized of a crime should similarly experience greater risk and/or anticipate more severe consequences of future victimization.

Figure 2 diagrams how our measures of perceived vulnerability are expected to influence fear of crime. Measures of perceived risk and perceived seriousness of the consequences of victimization are intervening variables in explaining how the demographic variables, knowledge of criminal events and environmental characteristics are related to fear of crime. That is, those groups most susceptible to fear should assess greater risk and more severe consequences of victimization. Being offense specific, these measures would allow us to determine which crimes are more fear provoking, and thus, provide a causal explanation as to why certain groups are more fearful of crime.

Revised Model

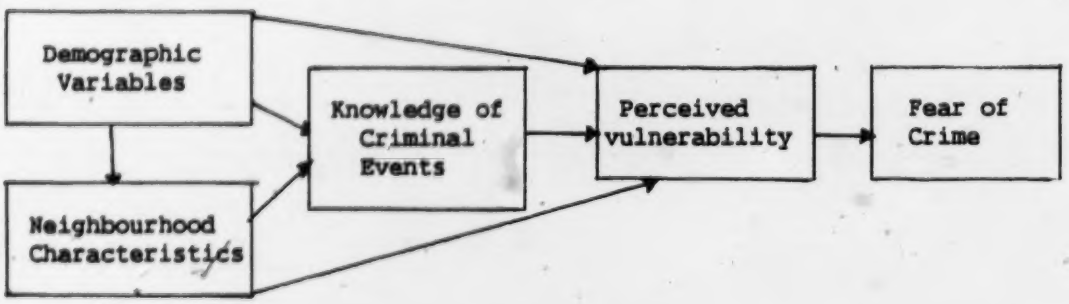

Figure 2

D. Conclusion

Skogan and Maxfield (1981) developed a comprehensive model of fear of crime by extending the vulnerability thesis. According to this model, fear is viewed as a rational response to the perceived threat of harm. Citizens who are fearful evaluate their environment as dangerous, assess their knowledge of criminal events, and evaluate themselves as being social and/or physically vulnerable to attack.

The argument presented by Skogan and Maxfield is plausible, but the equation of the demographic variables as measures of vulnerability prohibited an adequate analysis of the vulnerability thesis. To correct this problem, I propose to introduce measures of perceived risk and perceived seriousness with respect to specific crimes. These measures would allow a proper test of whether the aged, women, blacks and the poor fear crime because they see themselves as vulnerable to crime. These measures would also allow us to see whether the vulnerability thesis applies to the relationship of fear with knowledge of criminal events and neighbourhood characteristics. These measures would also clarify which crimes lead to greater fear. Since these measures are offense specific, we may be able to identify which crimes generate greater fear.

This research project entails testing the vulnerability argument within this extended conceptual framework. Based upon the revised model, I expect the following hypotheses to

hold if the vulnerability thesis is valid:

1. Women, the elderly, blacks, the poor, residents of high crime neighbourhoods, and those with knowledge of criminal events should be more fearful of crime.

2. Individuals who perceive themselves as being more vulnerable to criminal victimization should be more fearful of crime.

3. Perceptions of vulnerability should provide a causal explanation as to why certain groups are more fearful of crime. That is, we would expect women, the elderly, blacks, the poor, and those with knowledge of crime information to be more fearful of crime because they perceive themselves as being more vulnerable to criminal victimization. Residents of high crime neighbourhoods and those who perceive social disorder and/or crime to be a problem in the neighbourhood should also perceive themselves to be vulnerable to criminal victimization, and thus become more fearful of crime.

III. Data and Methods

A. Data Source

This study uses part of the dataset from The Chicago Metropolitan Area Survey. This survey was conducted in the summer of 1979 as part of the Citizen's Participation and Community Crime Prevention Project at the Center for Urban Affairs Policy Research, Northwestern University. The survey was designed to study the process which leads individuals to use crime prevention measures. Data for this project were made available by the Inter-University Consortium for Political and Social Research.

Data were collected using a technique called 'random digit dialing'. This procedure ensures that residents who had moved or who had unlisted telephone numbers were adequately represented in the dataset. Businesses and non-residential numbers were excluded. Call back procedures were used if residents were not home. In developing this survey, the researchers were able to establish the place of residence of each respondent. Seventy-six neighbourhoods were identified, and up-to-date crime reports and population estimates for each neighbourhood were obtained.[3]

The strength of this dataset is that data were available at both the individual and neighbourhood levels. One of the weaknesses of earlier research has been its focus

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[3] Skogan and Maxfield (1981) operationally identified neighbourhoods in terms of census tracts. They justify this definition on the grounds of the considerable social and economic homogenity within each tract.

on national or city wide data (McPherson, 1978; Skogan, . 1981). Without including neighbourhood characteristics, these studies were unable to link how environmental factors shape fear of crime. As demonstrated by Skogan and Maxfield (1981), fear varies considerably more within cities than between different cities. By not using neighbourhood characteristics, much of the variability in fear is lost.

With the exception to the study by Taub et. al. (1981) which studied the relationship between perceptions of risk and neighbourhood satisfaction, the earlier studies using this dataset focussed exclusively on the process which lead residents to employ precautionary measures (Lavrakas, 1981, 1982).[4]

B. The Model to Be Tested

The model to be tested is shown earlier in Figure 2, and provides a causal order of variables involved in explaining fear of crime. This model includes demographic variables to profile the fearful groups. It also includes other intervening variables that may have an affect on individual characteristics and fear. These include measures of the environment in which people live, their experiences with crime, and most importantly their views of their vulnerability to criminal victimization.

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[4]Earlier studies by Skogan and Maxfield (1981), Lewis and Maxfield (1980), Gordon et. al. (1980), Riger et al. (1978, 1982); Lavrakas and Lewis (1980), Maxfield (1984) and Lewis and Salem (1986) used data from the earlier 1977 study which surveyed three cities: Chicago, Philadelphia, and San Francisco.

The model provides some means of articulating the findings reported in the literature as to why certain groups are fearful of crime. While this model presents a causal ordering of variables, we cannot be sure that the causal order of variables are as indicated. It is possible that reciprocal effects exist between many of the variables, and these effects can only be detected with more complicated models (Duncan, 1975). Despite this problem, the model does allow us to properly test whether measures of perceived vulnerability provide an adequate explanation as to why certain groups are more fearful of crime.

C. Operationalization of Variables

Dependent Variable

One of the main problems with studies on fear of crime is the lack of standardization of operationalizing fear. Perceived risk (the likelihood of victimization) and concern about crime have been used in past studies as measures of fear (Yin, 1980, 1985). However, research evidence indicates that perceived risk and concern may be conceptually distinct from fear. Using the offense as the unit of analysis, Warr (1984, 1985, 1986) shows that perceptions of risk do not necessarily vary with fear. Researchers have referred to the work of Fustenberg (1971) to argue that fear and concern are two different measures (Lewis and Clarke, 1982; Gilles-Sims, 1984; Maxfield, 1984; Skogan and Maxfield, 1981; Skogan,

1987). Concern relates to interest in crime as a social issue while fear refers to fear of victimization. This distinction is important since individuals may be concerned about rising crime rates but may not necessarily be fearful.

There now appears to a be general consensus in the literature that fear of crime should measure the amount of anxiety a person has of becoming a victim (Clarke and Lewis, 1982; Yin, 1980; Gilles-Sims, 1984). The most common operationalization of this measure is 'How safe do you feel or would you feel being out alone in your neighbourhood at night (very safe, somewhat safe, somewhat unsafe, very unsafe)?' This item was available in the Chicago Metropolitan Area Survey, and was used in this project as a measure of fear. This measure was coded on a 4 point scale with 1=very safe, 2=somewhat safe, 3=somewhat unsafe and 4=very unsafe. This question was appropriate to this analysis since it relates directly to fear of crime within the respondents' neighbourhood.

Of all respondents surveyed, 21.1% of the sample were somewhat or very fearful of crime. The mean score on this item was 3.1 with a standard deviation of 0.954.

Despite the widespread use of this measure, this operationalization has been criticized for being a general measure of fear of crime. In a literature review, Eve (1984) argued that fear of specific offenses is not the same as fear of crime generally. Research evidence has shown that fear levels vary according to the types of offenses

considered (Warr and Stafford, 1983; Warr, 1984, 1985, 1987). There has been overwhelming support that personal offenses provoke greater fear (Skogan, 1987; Giles-Sims, 1984; Skogan and Maxfield, 1981; Maxfield, 1984; Yin, 1980, 1985). Sex and age effects have been reported to vary depending upon the type of offense considered (Warr, 1984, 1985, 1987; Horton, 1987; Atkinson, 1979; Riger, 1981). In a study of Seattle residents, Warr (1984) reported that the elderly were more fearful than other age groups for only 8 of the 16 offenses considered. Horton (1987) found that when property offenses are considered, women and men display similar levels of fear. However, despite these shortcomings, this operationalization of fear will be used in this project since it represents the most widely used measure of fear and was the only measure available in the dataset. This measure has been shown to be highly reliable given the consistent findings of past studies which have used this operationalization of fear.

Independent Variables

Data were available to cover the 3 basic components of Skogan and Maxfield's (1981) model: (1) demographic variables (sex, age, race and income), (2) environmental characteristics, and (3) knowledge of criminal events. To this model, we propose to add (4) measures of perceived risk and perceived seriousness of the consequences of victimization as measures of perceived vulnerability.

Demographic Variables

Sex, age, race and income have been consistently linked to fear. In this project, these variables will be used as exogeneous controls whose effects may be explained through measures of perceived vulnerability. Sex and race are dummy variables with 'female' or 'black' coded as '1' and 'male' or 'white' coded as '0'. Since the actual age of the respondent was not included in the data set, an age variable was created by subtracting the year of the respondent's birth from the year of the survey (1979). Income was represented in the dataset by an ordinal variable: 0=less than $6,000, 1=more than $6,001, 2=more than 10,000, 3=more than $15,000, 4=more than $20,000, 5=more than $30,000 and 6=more than $50,000. This income coding loses its metric, and recoding was necessary to put the values back into approximate dollar values. Thus, income categories were recoded according to the lower income bracket per $1,000. That is, income is now categorized as 0=less than $6000, 6=more than $6,001, 10=more than 10,000, 15=more than 15,000, 20=more than $20,000, 30=more than $,30,000, and 50=more than $50,000. However, by recoding income into dollar values, we may introduce the problem of non-linearity. That is, we expect that compared to higher income residents, a $,1,000 dollar increase in income would have a greater impact for those concentrated in the lower income bracket. This problem with non-linearity will be dealt with in the data analysis section.

Of the 1,803 respondents, 54% were women and 19.2% were black. The elderly (65 years or more) were represented by 9.8% of the sample. The average income of the respondents was $16,614 with the poor (income less than $6,000) comprising 12.5% of the total sample.

Neighbourhood Characteristics

By including neighbourhood traits, we consider how the environment may possibly shape individual perceptions of vulnerability. One of the strengths of this data set is that offense specific crime reports were available for all seventy six neighbourhoods. However, crime figures for burglary, assault and robbery were given in terms of raw numbers, and thus, are not comparable across neighbourhoods unless some form of standardization is used. Fortunately, the 1976 population figures for each of the neighbourhoods was available. Crime rates were calculated by dividing the actual incidence of crime by the population figures. All rates are expressed in terms of the number of crimes per 1,000 population. The assault rates in the 76 neighbourhoods varied from 0 to 16.13 per 1,000 residents. The robbery rate ranged from 0 to 61.31 per 1,000 population. For burglary the rates were higher and ranged from 1.73 to 67.78 per 1,000 residents. The mean rates were 2.13, 2.79 and 12.49 for assault, robbery and burglary respectively. When we compare the ranges with the means, we find that all crime rates are positively skewed.

Crime rates are unlikely to affect fear unless they affect individual perceptions of crime in the neighbourhood. These perceptional measures are likely to intervene in the relationship between the crime rates and fear. Perceptions of social disorder may indicate to respondents that social control mechanisms operating in the community are ineffective. These perceptions of social disorder are also likely to influence concern about crime in the neighbourhood. Measures of "incivility" (or social disorder) and concern about crime was represented in the data by the following set of questions:

> Now I'd like you to tell me whether each of the following is a big problem, some problem, or almost no problem in your neighbourhood.
>
> (1)...buildings or storefronts sitting abandoned or burnt out?
>
> (2)...How about fires being set on purpose in your neighbourhood?
>
> (3)...Vandalism, like kids breaking windows or writing on walls or things like that.
>
> (4)...People breaking in or sneaking into homes to steal something?
>
> (5)...Groups of teenagers hanging out on the streets.
>
> (6)...People being robbed or having their purses or wallets taken on the streets?

(7)...People being attacked or beaten up by strangers?

All questions were coded on a 3-point scale with 1 as almost no problem, 2 as some problem and 3 as big problem. Questions (4), (6) and (7) have been used in past studies as measures of concern about crime (Skogan and Maxfield, 1981; Maxfield, 1984; Lewis and Salem, 1986). The remaining items represent perceptions of incivility in the neighbourhood.

In several studies crime rates, concern, and incivility measures were combined to form 3 composite indices. However, before composite indices can be developed, the internal consistency of the measures will be checked using the SPSSx program, Reliability. However, even though a sufficiently high alpha (alpha greater than 0.70) is obtained, items cannot be combined to form an index unless all items affect the dependent variable in the same manner (Zeller and Camines, 1980). For this reason, the development of composite indices will be dealt with in the data analysis chapter.

Knowledge of Criminal Events

According to the model, individuals with access to crime information should become fearful of crime (Skogan and Maxfield, 1981; Lewis and Salem, 1986; Maxfield, 1984). Victimization experiences were represented in the dataset by two items.

> In the past couple of years has your home been broken into or has anyone tried to break-in?
>
> In the past couple of years have you been robbed or attacked, or has anyone tried to rob or attack you?

Responses for these indicators were dichotomized with 0=no, and 1=yes. Of all respondents, only 11.2% were victims of a burglary and 8.8% were victims of a personal offense.

Since very few people are victims of a crime, most people learn about crime from other sources. People learn about crime from social networks or the media. However, data to assess media effects and the degree of contact with neighbours were unavailable. Instead, 2 questions pertaining to the respondent's knowledge of crime victims were represented in the data.

> Do you personally know of anyone (else) whose home was broken into in the past couple of years or who has had someone try to break into their homes?
>
> Do you personally know of anyone (else) who has been robbed or attacked in the past couple of years, or who had someone try to rob or attack him?

These measures were also coded as 0=no, 1=yes. Consistent with the research, individuals were more likely to know of other victims than to be victims of a crime. 49.3% of the sample knew of others who had been burglarized, and 38.1% were aware of other victims of

personal crimes (robbery and assault).

Perceived Vulnerability

Perceived risk and perceived seriousness were used in this study as measures of perceived vulnerability. To measure perceived risk, respondents were asked:

> Now tell me how likely you think it is that the following things might happen to you in the next couple of years.
>
> ...having a stranger rob you on the street?
>
> ...having your home burglarized when no one is home?
>
> ...being attacked by a stranger?

Respondents answered using the following choices: 1=very unlikely, 2=somewhat unlikely, 3=somewhat likely, and 4=very likely. Of all respondents, 38.7% perceived themselves as being somewhat likely or very likely to be burglarized in the next few years. For the personal offenses, 38.3% and 30.1% of the respondents perceived themselves as being at risk from a robbery or assault, respectively. If we were to compare these figures with those of the actual crime rates for each of the three offenses, it would appear that respondents overestimate the probability of being victimized of a personal offense (robbery or assault).

To measure perceived seriousness, respondents were queried:

> Now I'd like to ask you how serious these things would be if they happened to you right now in your life. How about
>
> ...having your home burglarized when no one is home?
>
> ...having a stranger attack you?
>
> ...having a stranger rob you on the street?

Response categories were 1=not at all serious, 2=not too serious, 3=serious, and 4=very serious. As expected, more respondents perceived the personal crimes as having more serious repercussions. Of all respondents, 71.4% assessed the consequences of being burglarized as being severe, 85.1% for assault, and 76.2% for robbery.

D. Data Analysis

The present study was designed to further analyze the appropriateness of the vulnerability argument proposed by Skogan and Maxfield's Cognitive and Volitional model. To this model, I propose that measures of perceived risk and perceived seriousness of the consequences of victimization be included (see figure 2). The basic assumption of the model is that measures of perceived vulnerability act as intervening variables and accounts for most of the fear experienced by the most fearful groups in society. This

would require that the overall influence of our measures of perceived vulnerability be assessed when all independent measures are controlled for. One method to evaluate this assumption is to perform multiple regression analysis since this method controls for confounding factors so that we can evaluate the contribution of measures of perceived vulnerability. Bivariate regressions were also run to determine if each of the independent variables influences fear of crime.[5]

The levels of significance used in this thesis will be 0.01 and 0.05.

One major assumption of using regression analysis is that the independent variables are linearly related to the dependent variable. Brillon et. al. (1984) suggested that one reason for some of the discrepant findings in the area of fear of crime may be a result of some researchers not testing for possible curvilinear relationships between the independent measures and fear. There are two ways to test for a non-linear relationship. First, we can transform our dependent and/or independent variable. However, any change to the dependent variable is likely to modify the distribution of that variable and would represent a much more complicated analysis than just transforming the independent variable. Since most non-linear relationships in

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[5]In the bivariate regression, a significant slope does not discount the possibility that the relationship between the variables may be partly spurious. The use of multiple regression analysis will determine the effect of each of the independent variables when all other variables are controlled for.

the social sciences can be described by quadratic functions, tests for nonlinearity will involve adding the square of the independent variable into the bivariate regression equation for all interval level measures. If the square term is significant, this would indicate that the independent variable and fear may be curvilinearly related. However, scatterplots were also run to determine if the relationship between fear and the independent variable can best be represented by a quadratic function.

Since the literature suggests the possibility of interaction effects, tests for interaction were conducted. The simplest method to test for interaction is to introduce cross-product terms for each pair of variables that we would suspect may interact with each other. If the cross-product term is significant, we would have interaction. The use of the product term assumes a 'linear-by-linear' interaction. The slope of the dependent variable (y) on an independent variable (x) is linearly related to a second variable (z). This assumption is not problematic when one of the variables that make up the product is dichotomous (i.e. sex or race). It is problematic, however, when both variables are interval since the product term will not capture interaction which is non-linear. Only first order interactions will be tested in this project.[6]

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[6]Higher order interactions were not tested in this thesis since it involves a much more complicated analysis of data.

E. Presentation of Results

The results of the regressions performed in this project will be presented by a series of tables. The general format of the tables is as follows. The independent variables and respective slopes are contained in the columns. Unstandardized slopes are used since most variables are expressed in meaningful units. However, one problem with the use of unstandardized slopes is that the reported effects are very small for interval and ordinal measures (e.g. age, income, and crime rates). For example, our dependent variable, fear of crime ranges from 1 to 4, and our income variable has a range from 0 to 50. When fear is regressed on income, we would obtain a small slope. But because the units of income are in thousands of dollars, we are able to provide a more meaningful interpretation than using standardized slopes which are measured in terms of standard deviations. In addition to the independent variables and the slopes, each of the tables will also contain the square of the multiple correlation coefficient (R-square) which provides an estimate of the proportion of variance in the dependent variable explained by the linear combination of the independent variables.

IV. Testing the Cognitive and Volitional Model

A. Introduction

This chapter will analyze data from the Chicago Metropolitan Area Study to test the adequacy of the Cognitive and Volitional Model (Figure 1). The first section of this chapter will focus on identifying the groups most susceptible to fear. According to the literature women, the elderly, blacks and the poor are more fearful than their counterparts. The next section will assess whether those with knowledge of criminal events are more fearful of crime, and whether these measures account for fear of crime among women, the elderly, blacks and the poor. The final section will determine whether neighbourhood characteristics are linked to fear of crime and whether these measures possibly explains fear among the more fearful groups in society.

B. Are Women, the Elderly, Blacks and the Poor More Fearful of Crime?

According to the literature women, the elderly, blacks and the poor should be the more fearful groups in society. Table 1 shows the results of regressing each of the demographic variables on fear of crime. All slopes are significant. Since sex (0=men, 1=women) and race (0=white, 1=black) are represented by dummy variables, the positive significant slopes mean that compared to men and whites, women and blacks are more fearful of crime. The negative

TABLE 1
BIVARIATE REGRESSIONS
FEAR OF CRIME ON DEMOGRAPHIC VARIABLES

DEMOGRAPHIC VARIABLE	UNSTANDARDIZED SLOPE	R-SQUARE
SEX	0.6799*	0.1264
AGE	0.0104*	0.0292
INCOME	-0.0207*	0.0969
RACE	0.5926*	0.0625

*SIGNIFICANT AT P<=0.01.

slope for income means that for each $1,000 increase in income, we would expect a decline of 0.0207 on the four-point fear of crime scale. The interpretation for the positive slope for age is that for each one year increase in age we would expect a 0.0104 increase in the fear of crime scale.

Of all four demographic variables, sex (r-square=12.64%) explains the highest proportion of the variation in fear followed by income (r-square=9.69%), race (r-square=6.25%) and age (r-square=2.92%). Although age explains the least amount of variation in fear, this does not readily mean that age is the most weakly associated variable with fear. The use of r-square is appropriate only if a straight line represents a reasonable model for the relationship. Therefore, a low r-square does not necessarily imply that the variables are weakly related only that the form of the relationship may not be linear.

Tests for non-linearity were conducted for both income and age. The simplest method to test for non-linear relationships is by adding the square of the independent variable into the original bivariate regression (Agresti and Finlay, 1986). The results of these tests for non-linearity for both age and income are displayed in Table 2. When age-square is added to the original bivariate regression for age, R-square increases from 2.92% to 5.02%, and this change in R-square is significant. For income, when the square term is introduced, R-square increases from 9.69% to 12.86%. In

TABLE 2
TESTS FOR NONLINEARITY
FEAR OF CRIME ON AGE AND INCOME

	REGRESSION 1	REGRESSION 2
AGE	-0.0392*	-
AGE-SQUARE	0.0005*	-
INCOME	-	-0.0591*
INCOME-SQUARE	-	0.0008*
R-SQUARE	0.0502	0.1286

*SIGNIFICANT AT P <= 0.01.

both cases, the slopes of the square term for both age and income are positive and significant.

Table 3 presents the average scores for fear for selected age and income groups. Column 1 presents the actual average scores for each of the age and income groups. Column 2 shows the average predicted values when fear of crime is regressed on either age and income, while column 3 shows the results once the square of the independent variable is added to the bivariate regressions. For all these regressions age was recoded into five year categories. Regressions were run using the midpoint of each of these categories. Since income was already coded into categories according to its lower limit, no recoding was necessary. Comparing columns 1, 2 and 3, we see that the addition of the square term provides better estimates of the actual average scores.[7] Unlike column 3 which includes the square term, the bivariate regressions failed to capture the curvilinear relationships between the independent variables and fear of crime. With the exception of the 25-29 age category, the results of the second regression are closer to the actual scores than the predicted scores from the bivariate regressions. [8] The

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[7]Both means and expected values are estimates of the population conditional means. The expected values (from the regressions) are better estimates because they are based on parameter estimates that use the total sample. However, this argument assumes that the quadratic model holds for the population.

[8]In performing regression analysis, scatterplots should be run to ensure that the function fits the data. If the assumption of linearity are met then there should be no relationship between the residuals and predicted values. In order to ensure that the transformation used was appropriate, scatterplots were run on the residuals and on

TABLE 3
AVERAGE SCORES
FEAR OF CRIME ON AGE AND INCOME GROUPS

	AVERAGE ACTUAL SCORES	REGRESSION 1* AVERAGE PREDICTED SCORES	REGRESSION 2** AVERAGE PREDICTED SCORES
AGE			
18-24	1.82	1.67	1.86
25-29	1.81	1.73	1.76
30-34	1.73	1.78	1.71
35-39	1.67	1.83	1.70
40-44	1.67	1.88	1.72
45-49	1.91	1.93	1.78
50-54	1.82	1.98	1.88
55-59	1.97	2.03	2.01
60-64	2.07	2.08	2.19
65+	2.43	2.13	2.38
INCOME			
0- 6,000	2.49	2.24	2.50
6,001-10,000	2.20	2.10	2.17
10,001-15,000	1.97	2.00	1.99
15,001-20,000	1.77	1.88	1.79
20,001-30,000	1.61	1.76	1.62
30,001-50,000	1.46	1.53	1.44
50,000+	1.46	1.05	1.54

* FOR REGRESSION 1: $Y = 0.0101*AGE+1.4591$
$Y=-0.0238*INCOME+2.240$

** FOR REGRESSION 2: $Y=0.0007*SQAGE-0.0521*AGE+2.6389$
$Y=0.0007*SQINCOME-0.0591*INCOME+2.497$

pattern of curvilinearity for income is that fear increases as income decreases, but the effect decreases as income increases. For age, the pattern is that for those 18 to 44, age is inversely related to fear. However, for those 45 to 65+, age is positively linked to fear.

Some writers suggest that the demographic variables interact in their effects on fear of crime (Maxfield, 1984; Baldassare, 1986). To test this argument, fear of crime was regressed on each pair of demographic variables along with their cross-product(s). When interaction tests involved age or income, the square term was included along with its cross-products with the other demographic variable. This may, however, introduce the problem of collinearity to the model. To correct this problem, step-wise regressions were performed on interactions involving age and income. The direct effects were entered followed by the interaction terms. In accordance with the results reported by Skogan and Maxfield (1981), there is no evidence of interaction effects between any of the six combinations of the demographic variables. This indicates that fear of crime can be described by the main components and that there is no additional effect of being vulnerable on any of the two

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[8](cont'd) each of the interval independent variables. These scatterplots seem to suggest the possibility that a relationship may exist between each of our interval measures and its residuals. ANOVAs were then performed on the independent variables and its residuals. Results of these tests show that the means of the residuals do not differ significantly from each other. Thus, the addition of the square term appears to capture the bulk of the non-linearity, and the transformations used for both income and age are appropriate.

demographic variables at the same time. For instance, fear of crime for elderly females is no higher than would be predicted by taking the effects of sex and age separately.[9]

Table 4 presents the result of the multiple regression when fear is regressed on all the demographic variables. Taken together, the demographic variables account for 25.09% of the variation in fear. Compared to the bivariate regressions displayed in Table 1, the slopes for sex and race undergo reductions of 22.90% and 26.83%, respectively. For income and age, the slopes undergo more drastic reductions. Comparing the slopes from Table 2 with those of Table 4, we find that the slopes for age and income decrease by 56.12% and 52.45%, respectively. The square terms for both age and income undergo even further reductions of 40.0% and 62.50%, respectively. This indicates that a considerable proportion of the effects of age and income are due to sex and racial differences. That is, females and blacks are more likely to be concentrated in the lower income strata than their counterparts. Moreover, women tend to make up a much higher proportion of the elderly population. It would appear that these differences account for some of the fear experienced by different income and age groups.

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[9]The probable reason for this finding is that the measure of fear used in this study is polytomous. The measure of fear used in previous studies which reported interaction effects was dichotomous. The interaction effects reported in these studies are an artifact of using a dummy dependent variable in a regression.

TABLE 4
MULTIPLE REGRESSION
FEAR OF CRIME ON DEMOGRAPHIC VARIABLES

SEX	0.5242*
AGE-SQUARE	0.0003*
AGE	-0.0172**
INCOME-SQUARE	0.0003*
INCOME	-0.0281*
RACE	0.4336*
R-SQUARE	0.2509

* SIGNIFICANT AT P<=0.01
**SIGNIFICANT AT P<=0.05

The findings of this section provide support that mainly women, the elderly, the poor and blacks are more fearful of crime than their counterparts. However, it is important to note that although age and income are related to fear, the form of these relationships are best captured by quadratic functions. With the exception of those concentrated in the higher income bracket, generally, poorer respondents are more fearful than their wealthier counterparts. For different age categories, fear of crime tends to increase from middle-age to old-age. However, respondents 18-29 years of age report slightly more fear than those between the ages of 30-34. Although the effect of age on fear is significant, this variable explains the least amount of variation in fear (5.02%). No interaction effects were found among the demographic variables suggesting that the influence of the demographic variables on fear can be best described using main effects. Finally, the results of regressing fear on all demographic variables indicate that sex and racial differences account for a substantial proportion of the fear experienced by different income and age groups. In other words, part of the effects of age and income on fear are spurious.

C. Is Fear Related to Knowledge of Criminal Events?

The literature with respect to knowledge of criminal events have been mixed with some studies reporting that victims are more fearful while others report no relationship

(Baumer, 1978; Gomme, 1986). If the vulnerability thesis holds, we would expect that individuals with access to crime information should be more fearful than those who are unaware of criminal events.

Table 5, column 1, shows the results when fear is regressed on all measures of known criminal events. Taken together, all measures account for 4.63% of the variation in fear. There is evidence to suggest that being a victim of a crime is more fear provoking than learning about crime from other victims. For burglary, being a victim results in a slope of 0.2650 while learning about this crime from other victims has a slope of 0.1265. However, the offenses of assault and robbery appear to provoke greater fear. Being a victim of either an assault or robbery increases fear by about a third of a point, and knowledge of victims of these crimes increases fear by about 2-tenths of a point.

One explanation for the relationship between knowledge and fear is that the information circulated by social networks and the media are more likely to be about women and the elderly. According to Skogan and Maxfield (1981), individuals are more likely to be fearful of crime when they perceive the victim to be similar to themselves. If this explanation is correct, then the slopes for sex and age should be substantially reduced when all knowledge variables are controlled for.

Column 3 shows the results when fear is regressed on both the demographic and knowledge of crime measures. Column

TABLE 5
FEAR OF CRIME ON KNOWLEDGE VARIABLES AND DEMOGRAPHIC VARIABLES

	(1)	(2)	(3)
DEMOGRAPHIC VARIABLES			
SEX	-	0.5242*	0.5200*
AGE-SQUARE	-	0.0003*	0.0003*
AGE	-	-0.0172**	-0.0128
INCOME-SQUARE	-	0.0003*	0.0003*
INCOME	-	-0.0281*	-0.0261*
RACE	-	0.4336*	0.3985*
KNOWLEDGE OF CRIMINAL EVENTS			
ROBBERY/ASSAULT VICTIM	0.3619*	-	0.1725**
BURGLARY VICTIM	0.2650*	-	0.3011*
OTHER-ROBBERY/ASSAULT	0.1708*	-	0.2184*
OTHER BURGLARY	0.1265*	-	0.1380*
R-SQUARE	0.0463	0.2509	0.2916

* SIGNIFICANT AT P <= 0.01.
**SIGNIFICANT AT P <= 0.05.

2 shows the same regression displayed in Table 4 when fear was regressed on all demographic variables. Comparing column 2 with column 3 we see that the inclusion of the knowledge variables results in an increase in R-square from 25.09% to 29.16%. With the exception of the slope for age, the remaining slopes for the demographic variables undergo reductions of less than 10%.

Comparing the slopes of the knowledge variables with those of column 1, we see that the slope for assault/robbery victims underwent a reduction of 52.33%. One explanation is that the demographic variables, sex and age, suppress the effect of this variable. Victims of personal crimes report greater fear than non-victims. Males and younger respondents are more likely to be victimized of these types of offenses than their counterparts but report less fear. These relationships suppress the impact of personal victimization on fear.

Of the remaining slopes, all knowledge variables increase in importance. The slopes for those who knew of victims of a robbery/assault and burglary increase by 27.87% and 9.09%, respectively. The slope for burglary victims also show an increase of 13.62%. However, since there is little change in the demographic variables, this suggests that these knowledge variables do affect fear of crime, but do not account for fear among the more fearful groups.

In summary, this section has shown that there is a relationship between knowledge of criminal events and fear.

Individuals who have access to crime information are more likely to report fear of crime. However, knowledge of criminal events does not account for fear of crime among the more fearful groups.

D. Are Neighbourhood Characteristics Related to Fear?

Neighbourhood characteristics have been described as the most important determinant of fear of crime (Ward et al, 1986; Baumer, 1979). For the purposes of this study, all measures of neighbourhood characteristics pertain to crime. The only global or contexual variables used are the official crime rates which are available at the neighbourhood level. Perceptual measures used in the model relate to the respondents assessment of crime and social disorder within their neighbourhoods.

The first part of this section will deal with the formation of indices of neighbourhood characteristics. Skogan and Maxfield (1981) argue that the offenses of robbery and assault are similar since both crimes involve confrontation with the offender. These personal offenses should have similar effects on fear for both the crime rates and concern items, and thus, combining these items to form composite indices would appear plausible. Also, several researchers have used similar measures of social disorder and have found that these measures form a single scale of incivility. Therefore, tests will be conducted to determine if concern, crime rates and incivility items combine to form

3 distinct composite indices. The last part of this section will analyze how these indices affect fear of crime. Multiple regressions will be run to determine whether neighbourhood characteristics act as an intervening variables to explain part of the fear experienced among the more fearful groups.

The Development of Composite Indices

Table 6 shows the correlation matrix between all measures of neighbourhood characteristics. For crime rates, the robbery rate is highly correlated with the assault rate (R=0.8441) but displays a moderately high correlation with the burglary rate (R=0.5835). Similarly, concern about robbery as a neighbourhood problem is highly related with concern about assault (R=0.7607) but shows a more moderate relationship with burglary (R=0.5835). Crime rates correlate more highly with assessments of crime as a neighbourhood problem than with perceptions of incivility. Both the assault and robbery rates display stronger correlations with neighbourhood perceptions than the burglary. For incivility, these four measures show higher correlations with assessments of crime as a neighbourhood problem than with each other.

Table 7 shows the results of the bivariate regressions when fear is regressed on each of the neighbourhood indicators. Of all three crime rates, the official rate of assault explains the highest proportion of variation in fear

TABLE 6

CORRELATION MATRIX - NEIGHBOURHOOD CHARACTERISTICS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
CRIME RATES									
(1) ASSAULT	-	-	-	-	-	-	-	-	-
(2) ROBBERY	0.8441*	-	-	-	-	-	-	-	-
(3) BURGLARY	0.5299*	0.5835*	-	-	-	-	-	-	-
CONCERN									
(4) ASSAULT	0.3411*	0.2954*	0.1439*	-	-	-	-	-	-
(5) ROBBERY	0.3642*	0.3414*	0.1573*	0.7544*	-	-	-	-	
(6) BURGLARY	0.1786*	0.1600*	0.1149*	0.5462*	0.5824*	-	-	-	-
INCIVILITY									
(7) ABANDONED BLDGS	0.3341*	0.2662*	0.1573*	0.3951*	0.4650*	0.3951*	-	-	-
(8) ARSON	0.2235*	0.1664*	0.0946*	0.4009*	0.4507*	0.4009*	0.5987*		-
(9) VANDALISM	0.1402*	0.1094*	0.0438**	0.5711*	0.4745*	0.5711*	0.3987*	0.4713*	-
(10)TEENS ON STREET	0.2304*	0.1857*	0.0633*	0.4335*	0.4947*	0.4335*	0.3850*	0.3732*	0.4725*

* SIGNIFICANT AT P <= 0.01.
**SIGNIFICANT AT P <= 0.05.

TABLE 7
BIVARIATE REGRESSIONS
FEAR OF CRIME ON NEIGHBOURHOOD CHARACTERISTICS

	UNSTANDARDIZED SLOPE	R-SQUARE
CRIME RATES		
A) ASSAULT	0.1409*	0.1205
B) ROBBERY	0.0691*	0.1085
C) BURGLARY	0.0004*	0.0482
INCIVILITY		
A) PROBLEM-ABANDONED BUILDINGS	0.4406*	0.0716
B) PROBLEM-ARSON	0.3969*	0.0446
C) PROBLEM-VANDALISM	0.3974*	0.0758
D) PROBLEM-TEENS ON STREET	0.4255*	0.1043
CRIME AS A PROBLEM		
A) ASSAULT	0.6507*	0.1533
B) ROBBERY	0.7104*	0.2191
C) BURGLARY	0.4643*	0.1027

* SIGNIFICANT AT P <= 0.01.
**SIGNIFICANT AT P <= 0.05.

(R-square=12.05%), followed by robbery (R-square=10.85%) and burglary (R-square=4.82%). The effect of the assault rate (b=.1409) on fear is twice as large as the slope for the robbery rate (b=0.0691). In contrast, respondents are more concerned about robbery (b=0.7104) as being a neighbourhood problem than either assault (b=0.6507) or burglary (b=0.4643). For incivility, assessments of abandoned buildings (b=0.4406), and teens hanging out in the streets (b=0.4255) are more highly associated with fear, followed by concern over vandalism (b=0.3974) and arson (b=0.3969).

The similar size slopes and the R-squares for the assault and robbery rates suggest that a composite index can be created for crime rates. The internal consistency of the measures was checked using the SPSSX program, Reliability. Results of this test reveal that these rates can be combined to form an index with an alpha of 0.85.

Since burglary offenses were excluded in the calculation of the aggregated measures for crime rates, further tests should be conducted to determine if the burglary rate should be included in the model.

Table 8, column 1, contains the results when fear is regressed on all three crime rates. Taken together, all three rates explain 12.56% of the variation in fear. Of all three rates, only the burglary rate (b=0.0045) was insignificant. This indicates that the burglary rate does not affect fear when assault and robbery rates are controlled for, and thus, should not be included in the

TABLE 8
MULTIPLE REGRESSIONS
FEAR OF CRIME ON NEIGHBOURHOOD CHARACTERISTICS

	(1)	(2)	(3)
CRIME RATES			
ASSAULT	0.0960*	-	-
ROBBERY	0.0240*	-	-
BURGLARY	0.0045	-	-
CONCERN	-	0.1622*	-
ASSAULT	-	0.5084*	-
ROBBERY	-	0.1048*	-
BURGLARY			
INCIVILITY			
TEENS ON STREET	-	-	0.2904*
ARSON	-	-	-0.1543
VANDALISM	-	-	0.1703*
ABANDONED BUILDINGS	-	-	0.2164*
R-SQUARE	0.1256	0.2157	0.1385

*SIGNIFICANT AT P <= 0.01.

model.

Of the remaining two rates, the assault rate (b=0.0960) has four times the influence on fear compared to the robbery rate (b=0.0240). If these two rates were combined without weighting to form a single index, one would be assuming that both variables have similar effects on fear. To rectify this problem, a weighted total for crime rates was obtained. The slope for robbery was weighted by taking the slope of the robbery rate over the slope of the assault rate. This results in a weight of 0.2736 being assigned to the robbery rate. When fear is now regressed on both the assault rate and the weighted robbery rate the slopes now are the same size suggesting that both measures have equal influences on fear. Averaging the two rates would now be appropriate in creating a composite index for crime rates.[10]

Since crime rates are ratio level measures, tests of non-linearity were conducted on the bivariate regressions for robbery and assault, and the composite index. Table 9 shows the results of these regressions. All measures of official rates were curvilinearly related to fear. This means that fear increases with the crime rate, but the effect decreases as the rate increases.

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[10]After the composite measure for crime rates was created, fear of crime was regressed on this index. From this regression, a R-square of 12.52% was obtained which is very similar to the R-square obtained when fear is regressed on all three rates. This indicates that the aggregated index alone explains the same amount of variation in fear as the 3 crime rates taken together.

TABLE 9
TESTS FOR NON-LINEARITY
OFFICIAL CRIME RATES

	UNSTANDARDIZED SLOPE
ASSAULT	0.0235*
ASSAULT-SQUARE	-0.0099*
(R-SQUARE=13.24%)	
ROBBERY	0.1149*
ROBBERY-SQUARE	-0.0014*
(R-SQUARE=13.71%)	
AGGREGATED CRIME RATE	0.2777*
AGGREGATED CRIME RATE-SQUARE	-0.0117*
(R-SQUARE=13.93%)	

*SIGNIFICANT AT P <= 0.01.

Of all measures, the composite measure explains a higher proportion of the variation in fear (R-square=13.93%) followed by robbery (R-square=13.71%) and assault (R-square=13.24%). Although these differences in R-square are rather small, the aggregated index was used since it is related to both larger slopes and a larger r-square, but the use of either the robbery or assault rate would have been appropriate.

The similar size slopes and R-squares from the bivariate regression displayed in Table 7 suggest that concern about robbery (b=0.7104) and assault (b=0.6507) can be combined to form a single index. However, part of the influence of these variables on fear may be spurious. To determine the relative effect of all concern items, fear of crime was regressed on all 3 measures. Taken together, all concern measures account for 21.57% of the variation in fear (see Table 8, column 2). All concern measures are positive and significant suggesting that respondents who are concerned about crime also tend to be more fearful. Overall, concern about robbery (b=0.5084) had the strongest effect on fear, followed by assault (b=0.1622) and burglary (b=0.1048). If we were to compare the size of the slopes with those of Table 7, we find that when all concern measures are controlled for, the slopes for robbery, assault and burglary undergo reductions of 28.43%, 75.07% and 77.43%, respectively. These findings show that there is considerable overlap in the concern items, especially for

assault. That is, respondents who are concerned about assault are also more likely to be concerned about robbery and burglary in the neighbourhood. The fact that concern about burglary still exerts a significant effect on fear even when assault and robbery are controlled for suggests that this measure should be included in our model of fear of crime.

To determine if concern about burglary should be included in the calculation of the composite index, the internal consistency of the concern measures was checked using the SPSSx program, Reliability. Results of this test show that all three items combined to form a scale with an alpha of 0.8325. However, if burglary was not included in the scale, alpha would increase to 0.8621. Since this represents only a slight increase in alpha, burglary was included in the composite index since it significantly influences fear of crime.[11]

Several studies have used similar measures of incivility and have combined them together to form a single index (Lewis and Maxfield, 1980; Maxfield, 1984; Lewis and Salem, 1986). The Reliability test reveals that these items can be combined into a single scale with an alpha of 0.7678.

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[11]Further tests were conducted to determine whether the burglary item should be included in the calculation of the composite index for concern. Two indices were created. When burglary was included in the composite index, and fear was regressed on this index, a R-square of 20.21% was obtained. However, when burglary was not included in the index, R-square increases only slightly to 20.91%. The slight deflation of R-square is more likely due to the change of the sample size analyzed through the elimination of missing cases on the burglary item.

However, before these measures were combined to form a single index, the construct validity of the measures was checked by regressing fear on all measures of incivility. These results are displayed in Table 8, column 3. Taken together, all measures of incivility account for 13.85% of the variation in fear. With the exception of arson, all measures of incivility are positive and significant. Perceptions of seeing teens as a problem in the neighbourhood (b=0.2904) had the strongest influence on fear followed by abandoned buildings (b=0.2164), and vandalism (0.1703). The insignificant negative slope for arson suggests that this variable does not influence fear and should not be included in the composite index for incivility.[12]

Analyzing the Effects of Neighbourhood Indices

Since the goal of this thesis was to provide a causal explanation as to why certain groups are more fearful of

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[12]Because this finding is contradictory to that reported in the Reliability Test, further evidence was obtained to show that perceptions of arson as a neighbourhood problem should not be included in the composite index. To test this argument, two indices for incivility were created, one excluding arson and the other including this measure. Fear of crime was then regressed on each of these composite measures. As expected, when arson was included in the composite index we obtained a slightly deflated R-square of 12.78%, but when arson was excluded, R-square increases to 13.77% which is approximately the same proportion of variation used when regressing fear of crime on all 4 measures of incivility (R-square=13.85%). This represents a much larger drop in R-square compared to the concern measure when burglary was included in the composite measure. This provides further evidence that arson should not be included in the calculation of the composite index for incivility.

crime, each of the neighbourhood indices were regressed on the demographic variables and the knowledge variables. This would allow us to determine if neighbourhood characteristics possibly explain fear of crime among the more fearful groups. [13]

Table 10, column 1 displays the results of the regression when crime rates are regressed on the demographic variables. Consistent with the literature, only the slopes for race and income are significant. This indicates that lower income respondents and blacks are more likely to reside in high crime neighbourhoods. These two variables account for 36.81% of the variation in the crime rate.

Column 2 shows the results when incivility is regressed on the demographic variables. Sex, age, income and race only account for 8.69% of the variation in the incivility index. With the exception of sex and age-square, the slopes for the other demographic variables are significant. The positive slope for race (b=0.2274) indicates that blacks are more likely to perceive social disorder as being a neighbourhood problem. For age, the positive slope indicates that elderly respondents are more likely to perceive social disorder in their neighbourhood than their younger counterparts. Both income-square and income are significant. This indicates that individuals with low incomes are more likely to

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[13]Because age and income are interval level measures, tests for non-linearity were run to determine if these variables are curvilinearly related to crime rates, incivility and concern. These tests show that age and income are curvilinearly related to all three neighbourhood indicators.

TABLE 10
MULTIPLE REGRESSIONS
NEIGHBOURHOOD CHARACTERISTICS ON DEMOGRAPHIC VARIABLES

	CRIME RATES	INCIVILITY	CONCERN
DEMOGRAPHIC VARIABLES			
SEX	-0.0007	0.0445	0.0767*
AGE-SQUARE	0.0002	0.0009	0.0001
AGE	-0.0169	0.0113**	-0.0076
INCOME-SQUARE	0.0008*	0.0002*	0.0002
INCOME	-0.0520*	-0.0125*	-0.0162*
RACE	2.293*	0.2274*	0.2991*
R-SQUARE	0.3681	0.0869	0.1157

* SIGNIFICANT AT P <= 0.01
**SIGNIFICANT AT P <= 0.05

perceive more social disorder in the community.[14]

For concern (column 3), sex, income and race were significant and in the expected direction. Compared to their counterparts, women, poorer respondents and blacks are more likely to be concerned about crime. Taken together, the demographic variables account for 11.57% of the explained variation in the concern index.

Although we have shown that the demographic variables have differential influences on crime rates, incivility, and concern, we have not yet established whether it is these differences that account for the greater fear experienced among women, the elderly, the poor and blacks.

Table 11, column 2, shows the results when fear of crime is regressed on the demographic variables and crime rates. Column 1 displays the results when fear is regressed on the demographic variables. From column 2 we see that when crime rates are included, R-square increases from 24.27% to 30.75%. As expected, the slopes for race and income-square are no longer significant, suggesting that neighbourhood residence plays an important role in determining fear among different income and racial groups.

Column 3 shows the results when incivility is added to the regression model. Age and income-square are no longer significant. This indicates that the elderly and poorer

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[14]The point of inflection for income was found by taking the first derivative (incivility/income) and then equating it to zero. Between the $6000 to $31250 range, incivility declines with income. However, when income is between $31,250 and $50,000 incivility increases with income.

TABLE 11
STEPWISE REGRESSIONS
FEAR OF CRIME ON DEMOGRAPHIC VARIABLES AND NEIGHBOURHOOD INDICATORS

	(1)	(2)	(3)	(4)
DEMOGRAPHIC VARIABLES				
SEX	0.5335*	0.5354*	0.5057*	0.4846*
AGE-SQUARE	0.0002*	0.0002**	0.0002	0.0001
AGE	-0.0111**	-0.0106	-0.0051	-0.0040
INCOME-SQUARE	0.0003*	0.0002	0.0001	0.0001
INCOME	-0.0267*	-0.0165*	-0.0131**	-0.0119
RACE	0.4354*	-0.0067	-0.0279	-0.0226
NEIGHBOURHOOD INDICES				
CRIME RATE-SQUARE	-	-0.0118*	-0.0080*	-0.0063*
CRIME RATE	-	0.2611*	0.1995*	0.1611*
INCIVILITY	-	-	0.4537*	0.1364*
CONCERN	-	-	-	0.4804*
R-SQUARE	0.2427	0.3075	0.3633	0.4038

*SIGNIFICANT AT P < 0.01.
*SIGNIFICANT AT P < 0.05.

respondents express more fear since they perceive more social disorder in their neighbourhood. As expected, the slope for sex remains unchanged since there is no sex difference in perceptions of incivility (see Table 11, column 2). For crime rates-square and crime rates, the slopes are reduced by 32.20% and 23.59%, respectively. This indicates that part of the effect of crime rates acts indirectly through the incivility index to produce fear of crime.[15]

Column 4 shows the results once concern about crime is entered into the model. Taken together, neighbourhood characteristics and the demographic variables account for 40.38% of the variation in fear. The only significant slope for the demographic variables is sex. Comparing the slopes from column 3 with those of column 4, we see that the slopes for sex and income undergo reductions of less than 10% when concern about crime is included in the model. Sex and income are both weakly associated with concern, and as expected concern explained very little of the variation in fear for these two variables. For race, the slope decreases by 18.99% indicating that blacks are more likely to be concerned about crime in the neighbourhood.

In examining the slopes for the neighbourhood indices, we find that crime rates-square and crime rates are reduced by 21.25% and 19.25%, respectively. However, the slope for

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[15]Tests for interaction were conducted for the demographic variables and incivility. These tests reveal no evidence of interactional effects between any combination of the demographic variables and incivility.

incivility underwent a drastic reduction of 69.94%. This indicates that concern about crime does act as an intervening variable in the relationship between incivility and fear.[16]

Table 12, column 2 shows the results once knowledge of criminal events are introduced to the model. The addition of the knowledge variables leads to a small increase in R-square from 40.38% to 41.18%. Comparing column 1 with column 2, we see that the slopes for the knowledge variables undergo a sizeable reduction when neighbourhood indicators are included. The only significant slope for the knowledge variables was for burglary victims. The slopes for those who knew of a victim of a robbery/assault and burglary show large reductions of 57.19% and 79.86%, respectively. For victims of a personal offense and burglary the slope decreases by 48.63% and 46.86% respectively. This indicates that neighbourhood variables intervene in the relationship between knowledge and fear.[17] The effect of having knowledge of criminal events tends to make respondents more sensitive

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[16]An alternative explanation is that concern about crime and incivility may be measuring the same phenomenon. This would account for the strong relationship between the two indicators.

[17]It is possible that knowledge and neighbourhood crime rates may interact to produce fear of crime. That is, compared to their counterparts, residents of high crime neighbourhoods may be more fearful when they have access to crime information. To test this argument, tests of interaction were conducted between all knowledge measures and fear. Significant interactions were found between knowing a victim of a crime and crime rates. However, these interactions are not discussed more fully, since they were found to be insignificant in the final model.

TABLE 1?
STEPWISE REGRESSION
FEAR OF CRIME ON DEMOGRAPHIC VARIABLES,
NEIGHBOURHOOD INDICATORS AND KNOWLEDGE VARIABLES

	(1)	(2)	(3)
DEMOGRAPHIC VARIABLES			
SEX	0.5200*	0.4866*	0.4853*
AGE-SQUARE	0.0003*	0.0001	0.0001
AGE	-0.0128	-0.0027	-0.0023
INCOME-SQUARE	0.0003*	0.0001	0.0001
INCOME	-0.0261*	-0.0122**	-0.0130**
RACE	0.3985*	-0.0115	0.2101
NEIGHBOURHOOD INDICES			
CRIME RATE-SQUARE	-	-0.0059**	-0.0029*
CRIME RATE	-	0.1551*	0.1771*
INCIVILITY	-	0.1292*	0.1640*
CONCERN	-	0.4298*	0.4265*
INTERACTION TERM			
RACE X CRIME RATE	-	-	-0.0951*
KNOWLEDGE			
VICTIM-ROBBERY/ASSAULT	0.1725**	0.0886	0.0846
VICTIM-BURGLARY	0.3011*	0.1600*	0.1600**
OTHER-ROBBERY/ASSAULT	0.2184*	0.0935	0.0849
OTHER-BURGLARY	0.1380*	0.0278	0.0236
R-SQUARE	0.2916	0.4118	0.4165

*SIGNIFICANT AT P < 0.01.
**SIGNIFICANT AT P < 0.05.

to crime and social disorder in the community.[18]

Tests for interaction reveal that income, race, and all knowledge variables interact with crime rates to produce fear of crime. Because of the possibility that multicollinearity can be introduced to the model, these interaction terms were entered using stepwise regression.[19] Of all interaction effects, only the race by crime rate interaction was significant (column 3).

Table 13 shows the average predicted scores for race based upon the crime rates, From the table we see that in low crime neighbourhoods, blacks tend to be more fearful of crime. However, in high crime neighbourhoods, whites are more fearful of crime.

In summary, the findings of this section show that neighbourhood characteristics strongly influence fear of crime. Residents of high crime neighbourhoods, and those concerned about incivility and/or crime in the neighbourhood are more likely to express fear.

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[18]Further evidence to substantiate this argument was obtained when each of the neighbourhood indices were regressed on all knowledge variables. For incivility and concern, all slopes for the knowledge variables were positive and significant indicating that those with access to crime information tend to perceive social disorder and crime in the neighbourhood. For crime rates, with the exception of the slope for those who knew of a burglary victim, all slopes were positive and significant. This indicates that those who have access to crime information are likely to live in high crime neighbourhoods.

[19]These interactions terms are not discussed fully since, with the exception of the race by crime rate interaction, all others were found to be insignificant in the final model.

TABLE 13
AVERAGE PREDICTED VALUES FOR INTERACTION
RACE WITH CRIME RATES*

	CRIME RATES(PER 1,000 POPULATION)*			
	0	1	4	7
RACE*				
WHITE(=0)	1.473	1.782	2.577	3.174
BLACK(=1)	1.721	1.941	2.469	2.799

Neignbourhood characteristics also account for some of the fear experienced by women, the elderly, blacks and the poor. Women are more concerned about crime than men and thus, are more fearful. However, the relationship between concern and sex is weak, and explained very little of the variation in fear. For age, the elderly tend to perceive more social disorder in the neighbourhood and thus become more fearful of crime. The relationship between race and crime rates is more complicated. Blacks tend to be more fearful in low crime neighbourhoods but express less fear in high crime neighbourhoods than compared to their counterparts, lower income respondents are fearful of crime since they perceive more crime and social disorder in their neighbourhoods.

Neighbourhood characteristics also intervene in the relationship between knowledge and fear. Having knowledge of criminal events may make respondents more sensitive to social disorder and crime in the neighbourhood and thus, lead to greater fear.

E. Conclusion

In summary, this chapter finds support for hypothesis 1. Compared to their counterparts, women, the elderly, blacks, and the poor are more fearful of crime. Individuals with crime information, residents of high crime neighbourhoods and those who perceive more social disorder and/or crime in their neighbourhoods also express greater

fear.

This chapter also shows that neighbourhood characteristics play a large role in explaining fear among the more fearful groups. Lower income respondents are more fearful of crime since they perceive more social disorder and crime in their neighbourhood. Blacks are more fearful than whites in low crime neighbourhoods but tend to be less fearful in high crime neighbourhoods. Compared to other age groups, the elderly tend to perceive more social disorder and thus, were more fearful.

Neighbourhood characteristics failed to account for the bulk of fear expressed by women. Concern about crime was only weakly associated with sex, and thus explained very little of the sex difference in fear. This suggests that other variables need to be included in the model to account for fear of crime among women.

V. Perceived Vulnerability as an Explanation of Fear

A. Introduction

The purpose of this chapter is to test the adequacy of the vulnerability thesis. Measures of perceived risk and perceived seriousness are added to the Cognitive and Volitional Model (see Figure 2). The addition of these measures would allow a proper test of the vulnerability argument. According to the revised model, certain groups would be more fearful of crime since they perceive greater risk and more severe consequences of victimization.

The first part of this chapter will show that measures of perceived vulnerability are distinct from measures of fear, concern and incivility. Earlier work by Yin (1980) suggests that measures of perceived risk and perceived seriousness may be measures of fear of crime. Next, I will show that measures of perceived vulnerability are related to fear of crime. According to the model, individuals who perceive themselves as being vulnerable to criminal victimization should be more fearful of crime. Finally, the last part of this chapter will determine whether perceived vulnerability explains fear among the more fearful groups in society.

B. Perceived Risk and Perceived Seriousness as Measures of Perceived Vulnerability

In a literature review Yin (1980) suggested that measures of perceived risk and the perceived seriousness of victimization may be appropriate measures of fear of crime. If this assertion is correct, then measures of perceived risk and perceived seriousness should be highly correlated with each other and to fear. Thus, including perceived risk and perceived seriousness may introduce the problem of collinearity to the model.

One simple method to test whether these indicators are measures of fear is to perform a factor analysis. A factor analysis reduces a large number of variables to a smaller set of factors that are uncorrelated, and thus, provides a solution to the problem of collinearity. Since concern about crime has been mentioned as a possible measure of fear (Yin, 1980, 1985), these measures were included in the factor analysis along with perceived risk, perceived seriousness, and our dependent measure of fear.

Table 14 shows the results of the factor analysis. The numbers displayed in the columns are the correlations of each of the measures with each of the respective factors. From the table, we see that three factors are identified: (1) concern about crime, (2) perceived seriousness and (3) perceived risk of victimization. The dependent measure of fear is not strongly correlated with either of the three factors. This suggests that three composite measures can be

TABLE 14
RESULTS OF FACTOR ANALYSIS USING ALL POSSIBLE MEASURES OF FEAR
ORTHOGONAL ROTATED FACTOR MATRIX

	FACTOR 1	FACTOR 2	FACTOR 3
CONCERN			
ROBBERY	0.8987	0.0594	0.1800
ASSAULT	0.8208	0.0399	0.1610
BURGLARY	0.6180	0.0807	0.2047
FEAR OF CRIME	0.4508	0.1965	0.2790
SERIOUSNESS			
ROBBERY	0.0954	0.7998	0.0605
ASSAULT	0.0552	0.7660	0.1120
BURGLARY	0.0785	0.6079	0.0610
RISK			
ROBBERY	0.2116	0.0684	0.7455
ASSAULT	0.2085	0.1087	0.7470
BURGLARY	0.1469	0.0586	0.5428

created for concern, perceived risk and perceived seriousness, and that all these measures and our dependent variable can be included in the model without the problem of collinearity.

Even though the factor analysis suggests that composite indices can be created, we cannot readily construct these indices unless the measures we wish to combine into a single scale affect fear in a similar manner. Table 15 shows the results of the bivariate regressions when fear of crime is regressed on each of the measures of perceived risk and perceived seriousness. From the table, we see that all effects are in the expected direction. That is, individuals who perceive either high risk or more serious consequences of victimization are more likely to be fearful regardless of the type of offense involved. Of all three offenses, burglary has the smallest slopes with respect to both perceived risk and perceived seriousness of victimization. The slope for the perceived risk of robbery (b=0.3144) is slightly higher than the slope for assault (b=0.2824). The opposite is true when we examine the perceived seriousness of the two offenses. The perceived consequences of being a victim of an assault generates a slightly higher slope (b=0.2539) than that of robbery (0.2381). However, it can be argued that the differences in the slopes are negligible and both robbery and assault affect perceptions of vulnerability in a similar manner.

TABLE 15
RESULTS OF BIVARIATE REGRESSIONS
FEAR OF CRIME ON PERCEIVED RISK AND SERIOUSNESS

OFFENSE	RISK		SERIOUSNESS	
	B	R-SQUARE	B	R-SQUARE
ASSAULT	0.2824*	0.0800	0.2539*	0.0457
ROBBERY	0.3144*	0.1039	0.2381*	0.0437
BURGLARY	0.1833*	0.0338*	0.1933*	0.0313

*SIGNIFICANT AT P<=0.01.

The similar size slopes and r-squares for risk and seriousness for both robbery and assault along with the results obtained from the Factor Analysis in Table 14 suggest that these measures can be combined to form two composite indices. However, it is still not clear whether measures of perceived vulnerability to burglary should be included in the model. If perceived vulnerability to burglary is to be included in the model, it should exert significant influences on fear.

To test this argument, fear of crime was regressed on all offense-specific measures of perceived vulnerability. Table 16 contains the results of this regression. Taken together, all measures of perceived vulnerability accounted for 15.83% of the variation in fear. For burglary, both perceived risk and the perceived seriousness of this offense exert insignificant effects on fear at an alpha of 0.01. Even though perceived seriousness of assault is insignificant at this level, the p-value was 0.02 and was much closer in reaching significance than the perceived risk of burglary which had a p-value of 0.05.

Since burglary was suspected as contributing little to fear of crime, the regression was rerun including only measures of perceived risk and perceived seriousness of victimization for robbery and assault. Measures of perceived vulnerability for these offenses account for 16.0% of the variation in fear. Although this represents only a slight fluctuation in r-square, measures of perceived vulnerability

TABLE 16
FEAR OF CRIME ON
ALL MEASURES OF PERCEIVED VULNERABILITY

	SLOPE	P-VALUE
RISK		
ASSAULT	0.1085	0.0003
ROBBERY	0.2175	0.0000
BURGLARY	0.0321	0.2225
SERIOUSNESS		
ASSAULT	0.0876	0.0158
ROBBERY	0.1033	0.0034
BURGLARY	0.0590	0.0490

R-SQUARE =15.83%

of burglary did not contribute but slightly deflated the explained variation in fear.[20] The fact that perceived vulnerability to burglary contributes little to the explained variation in fear when the other two crimes are considered suggests that perceived vulnerability to burglary should not be included in the model.

Since we have established that assault and robbery offenses can be combined to form two single indicators for the perceived risk and the perceived seriousness of personal crimes, the next step is to determine the relationship between the indicators and fear of crime. Taken together, both composite measures account for 15.71% of the variation in fear. This is approximately the same amount of explained variance obtained in Table 16 when fear is regressed on all single indicators of perceived vulnerability (R-square=15.83%). The perceived risk (b=0.3518) has a larger effect on fear than the perceived seriousness of victimization (b=0.2310). Comparing the slopes to determine the magnitude of the effects was possible in this case, since both measures are on a 4-point scale. [21]

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[20]R-square ordinarily increases with the addition of new variables. The reduction in R-square with the addition of the perceived vulnerability of burglary is due, first, to the change in the sample analyzed through the elimination of cases missing on this variable, and second, to the fact that perceived vulnerability does not affect fear when assault and robbery are controlled for.

[21]A preliminary analysis of the data revealed the possibility that perceived risk and perceived seriousness interacted in their effects to produce fear of crime. However, subsequent analysis of the data revealed that when all independent measures are included in the model, multicollinearity occurred and both perceived risk and perceived seriousness of victimization were insignificant

In summary, the findings of this section show that measures of perceived risk and perceived seriousness are distinct from measures of concern and fear of crime. This section also provides support for hypothesis 2. Individuals who perceive high risk and more severe consequences of victimization tend to be more fearful of crime. Moreover, it is the perceived vulnerability to the personal crimes (i.e. assault and robbery) that contributes significantly to fear of crime.

C. Does Perceived Vulnerability Explain Fear?

Although we have established that perceived vulnerability is an important measure in the study of fear of crime, we have not yet shown that the more fearful groups perceive themselves as being more vulnerable to criminal victimization.

Table 17 shows the results of the bivariate regressions when all measures of perceived vulnerability are regressed on each of the demographic variables. The positive, significant slopes for sex indicate that compared to men, women are more likely to perceive greater risk and more

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[21](cont'd) when the cross-product of the two variables was included in the model. Tests were conducted to determine which variables contributed to collinearity. It was found that the direct effects for perceived risk and the perceived seriousness of victimization accounted for 96.67% of the variation in the interaction term. This suggests that the interaction term should not be included in the model since the direct effects accounted for nearly all variation in the interaction term. When the interaction term was deleted from the final analysis, it was found that this corrected the problem of collinearity.

TABLE 17
BIVARIATE REGRESSIONS
RISK AND SERIOUSNESS OF VICTIMIZATION
ON DEMOGRAPHIC VARIABLES

DEMOGRAPHIC VARIABLES	OFFENSE	RISK SLOPE	RISK R-SQUARE	SERIOUSNESS SLOPE	SERIOUSNESS R-SQUARE
GENDER	ASSAULT	0.2365*	0.0157	0.6133*	0.1481
	ROBBERY	0.2307*	0.0139	0.4728*	0.0799
	BURGLARY	0.1240*	0.0042	0.3655*	0.0444
AGE	ASSAULT	-0.0040*	0.0043	0.0000	0.0000
	ROBBERY	-0.0012	0.0004	0.0001	0.0001
	BURGLARY	-0.0039*	0.0040	-0.0027**	0.0024
INCOME	ASSAULT	-0.0108*	0.0199	-0.0057*	0.0082
	ROBBERY	-0.0124*	0.0246	-0.0078*	0.0138
	BURGLARY	-0.0024	0.0010	-0.0102*	0.0209
RACE	ASSAULT	0.4397*	0.0350	0.0379	0.0004
	ROBBERY	0.4661*	0.0367	0.1760*	0.0074
	BURGLARY	0.2238*	0.0089	0.2386*	0.0123

* SIGNIFICANT AT P<=0.01
**SIGNIFICANT AT P<=0.05

severe consequences of victimization. This sex difference is more pronounced for the personal offenses (assault and robbery) than for burglary. Moreover, differences in perceived vulnerability among men and women appear to be greater for the perceived seriousness rather than the perceived risk of victimization.

For race, blacks are more likely to perceive themselves as being more vulnerable to crime than whites. Blacks are also more likely to perceive themselves at higher risk from personal victimization, and view the consequences of being victimized from a burglary as being more severe.

Compared to their counterparts, poorer respondents are more likely to perceive themselves as being at higher risk and are more likely to perceive more severe consequences if victimized. Similar to blacks, poorer respondents perceive the consequences of being victimized from a burglary as being more severe than being a victim of a personal offense.

The results obtained for age are surprising. Although the slope for all measures of perceived risk are insignificant, the negative slopes indicate that younger respondents are more likely to view themselves as being more likely to be victimized than their older counterparts. For the perceived seriousness of victimization, the only significant slope is for burglary, but this slope is also negative. The remaining two slopes for the perceived seriousness of both assault and robbery were equal to 0.00, and explained very little of the variation in the fear

(R-square<=0.0001). These results suggest that measures of perceived vulnerability employed in this study are not likely to explain the differences in fear among the different age groups.

The low R-squares for age may also be an indication that age may be non-linearly related to perceived vulnerability. To test this possibility of a non-linear relationship, the square of the independent variable was added to the regressions for age. Similar tests were also conducted for income since this variable is an interval level measure.

Table 18 shows the results of these regressions. For income, the square term is significant for both the perceived risk and perceived seriousness of robbery ($p < 0.05$). For age, the addition of the square term is significant only for the perceived seriousness of robbery and the perceived risk for burglary. However, both age and age-square explain very little of the variation in fear. These results suggest that differences in perceived vulnerability is not likely to account for fear among the elderly.[22]

Table 19 presents the results when the composite measures for perceived risk and perceived seriousness are regressed on all demographic variables. Taken together, the demographic variables account for 7.17% of the variation in

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[22]Although age appears not to be linearly or quadratically related to perceived vulnerability this does not eliminate the possibility that age can be best represented by other functions. See Agresti and Finlay pp. 358-368

TABLE 18

TESTS FOR NONLINEARITY
PERCEIVED RISK AND PERCEIVED SERIOUSNESS
ON AGE AND INCOME

		RISK		SERIOUSNESS	
VARIABLES	OFFENSE	SLOPE	R-SQUARE	SLOPE	R-SQUARE
INCOME	ASSAULT	-0.0175*	0.0210	-0.0080	0.0084
INCOME-SQUARED		0.0001		0.0000	
INCOME	ROBBERY	-0.0277*	0.0302	-0.0168*	0.0165
INCOME-SQUARED		-0.0003*		0.0002**	
INCOME	BURGLARY	-0.0062	0.0013	-0.0096*	0.0209
INCOME-SQUARED		0.0001		-0.0000	
AGE	ASSAULT	-0.0096	0.0046	-0.0074	0.0007
AGE-SQUARED		0.0001		0.0001	
AGE	ROBBERY	-0.0144	0.0018	0.0226*	0.0061
AGE-SQUARED		0.0001		0.0003*	
AGE	BURGLARY	0.0136	0.0066	-0.0159	0.0042
AGE-SQUARED		-0.0002**		0.0001	

* SIGNIFICANT AT P<=0.01
**SIGNIFICANT AT P<=0.05

TABLE 19
MULTIPLE REGRESSION
PERCEIVED VULNERABILITY MEASURES ON
DEMOGRAPHIC VARIABLES

	DEPENDENT VARIABLE	
	RISK	SERIOUSNESS
SEX	0.1672*	0.5413*
AGE-SQUARE	0.0000	0.0002**
AGE	-0.0049	-0.0164*
INCOME-SQUARE	0.0001	0.0001
INCOME	-0.0136**	-0.0060
RACE	0.3539*	0.0552
R-SQUARE	0.0717	0.1524

* SIGNIFICANT AT P<=0.01
**SIGNIFICANT AT P<=0.05

perceived risk. When all other demographic variables are considered, sex, race and income are significant and in the expected direction. [23]

For the perceived seriousness (column 2) the demographic variables account for 15.24% of the explained variation.[24] The positive slope for sex indicates that women perceive more severe consequences of victimization than do men. The slopes for age and age-square are significant suggesting that age exerts an important influence in predicting the perceived seriousness of victimization. [25] For the 18-41 age groups, younger respondents tend to perceive more severe consequences of victimization than their older counterparts. However, for those 45 years and older, age is positively related to the perceived seriousness. Compared to all age groups, the elderly express the highest level of vulnerability. These results are consistent with those of Table 18 where age was found to be curvilinearly related to the perceived seriousness of robbery. The elderly were more likely to be affected by perceptions of the seriousness of the consequences of

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[23]Because income-square was insignificant, tests for non-linearity were run. Similar tests were also run for age. Only income was found to be curvilinearly related to perceived risk. The square of both variables were included in the regression because both income and age are curvilinearly related to fear. If the square terms were not included, it would have little effect on the explained variation for both regressions.

[24]Tests for non-linearity were run for both age and income. These tests show that only age was curvilinearly related to the perceived seriousness of victimization.

[25]The point of inflection for age (age=41) was found by taking the first derivative of the age equation and then equating it to 0.

victimization.

If the vulnerability thesis holds, we would expect that individuals with knowledge of criminal events should perceive themselves as being more vulnerable to criminal victimization. However, in a recent study, Skogan (1987) argued that researchers may have misspecified the relationship between victimization and fear. Researchers have long argued that women and the elderly are more likely to suffer more severe consequences of victimization. However, Skogan (1987) suggested that the consequences of victimization may be equally severe for these groups, so that the impact of victimization may be equally shared by all groups of victims. If Skogan's argument is true, then there should be no difference in the perceived seriousness of the consequences of victimization among those with access to crime information.

In order to test this argument, perceived risk and perceived seriousness were regressed on the demographic and knowledge variables. Results of these two regressions are displayed in Table 20. From the table, we see that those with knowledge of criminal events are more likely to perceive greater risk of victimization. With the exception of burglary victims, knowledge of crimes had no effect on the perceived seriousness of victimization. In comparing the slopes of the demographic variables from Table 19 with those of Table 20, we see that for perceived risk the slopes for sex, age, income and race undergo very slight reductions of

TABLE 20
MULTIPLE REGRESSION
PERCEIVED RISK AND PERCEIVED SERIOUSNESS
ON DEMOGRAPHIC VARIABLES AND KNOWLEDGE VARIABLES

	DEPENDENT VARIABLE	
	RISK	SERIOUSNESS
DEMOGRAPHIC VARIABLES		
SEX	0.1519*	0.5437*
AGE-SQUARE	0.0000	0.0002
AGE	-0.0002	-0.0164*
INCOME-SQUARE	0.0001	-0.0002*
INCOME	-0.0120**	0.0064
RACE	0.3203*	0.0514
KNOWLEDGE OF CRIMINAL EVENTS		
VICTIM-ROBBERY/ASSAULT	0.3680*	0.0246
VICTIM-BURGLARY	0.2440*	0.1175**
OTHER-ROBBERY/ASSAULT	0.2655*	-0.0127
OTHER-BURGLARY	0.1486*	-0.0266
R-SQUARE	0.1506	0.1556

* SIGNIFICANT AT P <= 0.01.
**SIGNIFICANT AT P <= 0.05.

less than 12%. For perceived seriousness, the effects of the demographic variables undergo only negligible declines. These results suggest having knowledge of criminal events does explain some of the differences in perceived risk, but not perceived seriousness among the demographic groups.

Although we have established that certain groups view themselves as being more vulnerable to criminal victimization, we have not yet established whether our measures of perceived vulnerability account for most of the fear experienced by the most fearful groups. If the vulnerability thesis holds, then the slopes for the demographic variables would be substantially reduced and/or be no longer significant in the final model when measures of perceived vulnerability are taken into account. [26]

Table 21, column 2, contains the results when fear is regressed on the demographic variables and measures of perceived vulnerability. Taken together, the demographic variables and perceived vulnerability account for 31.81% of the variation in fear. Column 1 shows the results of the regression when fear is regressed on the demographic variables only. Comparing the size of the slopes, we find that sex, race and income undergo reductions of 22.30%, 22.97%, and 15.30%, respectively when measures of perceived

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[26]Although perceived risk and the perceived seriousness of victimization were found to have differential influences on fear, these measures were added to regression equation at the same time. According to the model, both measures of vulnerability are assumed to be intervening variables in the relationship between the demographic variables and fear. Neither variable is assumed to be causally linked to the other.

TABLE 21
PERCEIVED VULNERABILITY
AS AN EXPLANATION OF FEAR OF CRIME

	(1)	(2)	(3)
DEMOGRAPHIC VARIABLES			
SEX	0.5242*	0.4073	0.4169*
AGE-SQUARE	0.0003*	0.0003*	0.0003*
AGE	-0.0172**	-0.0175**	-0.0129
INCOME-SQUARE	0.0003*	0.0003*	0.0003
INCOME	- 0.0281*	-0.0238*	-0.0235**
RACE	0.4336*	0.3340*	-0.3195*
NEIGHBOURHOOD INDICES			
CRIME RATE-SQUARE	-	-	-
CRIME RATE	-	-	-
INCIVILITY	-	-	-
CONCERN	-	-	-
INTERACTION TERMS			
RACE X CRIME RATE	-	-	-
KNOWLEDGE			
VICTIM-ROBBERY/ASSAULT	-	-	0.0888**
VICTIM-BURGLARY	-	-	0.2331**
OTHER-ROBBERY/ASSAULT	-	-	0.1592*
OTHER-BURGLARY	-	-	0.1046*
PERCEIVED VULNERABILITY			
RISK	-	0.2754*	0.2310*
SERIOUS	-	0.1120*	0.1123*
R-SQUARE	0.2509	0.3181	0.4165

*SIGNIFICANT AT P < 0.01.
*SIGNIFICANT AT P < 0.05.

vulnerability are taken into account. This indicates that a considerable proportion of the effect of these three variables acts indirectly through the measures of perceived vulnerability to produce fear of crime. The slopes for age and age-square remain virtually unchanged when perceived vulnerability are added to the regression equation. This indicates that the measures of perceived vulnerability employed in this study do not account for fear among the elderly.

Column 3 shows the results when knowledge of criminal events are introduced to the regression. Taken together, the demographic variables, knowledge of crime and perceived vulnerability accounted for 34.09% of the variation in fear. Both slopes for perceived vulnerability are positive and significant with perceived risk (b=0.2310) having two times the effect on fear than the perceived seriousness of victimization (b=0.1123). Comparing the slopes of the demographic variables from column 2 with those of column 3, we find that the slope for sex increases in size when knowledge variables are considered. The remaining slopes for the demographic variables remain unchanged or undergo very slight reductions. By comparing the slopes of column 3 with those of Table 5, column 3, we can determine the effects of perceived vulnerability on the knowledge variables. When perceptions of vulnerability are controlled for, the slopes for victims of a robbery/assault and burglary undergo reductions of 48.52% and 22.58% respectively. Moreover, for

those who know burglary or assault/robbery victims, the slopes were reduced by 24.20% and 27.11%, respectively. These results show that perceived vulnerability does play a large role in determining fear of crime among those with knowledge of criminal events.

Table 22, column 2, shows the results once neighbourhood characteristics are added to the model. Column 1 shows the regression displayed in Table 12, column 3 when measures of perceived vulnerability are excluded from the model. Comparing the slopes of the neighbourhood indicators, we see that the slopes for crime rates-square, crime rates, incivility and concern undergo reductions of 10.34%, 8.02%, 13.82% and 10.97%, respectively. The slopes for perceived risk and perceived seriousness both undergo substantial reductions of 47.9% and 40.8%, respectively. This indicates that although perceived vulnerability does account for some of the fear among residents of high crime neighbourhood and among those who perceive more social disorder and crime in their neighbourhoods, a considerable proportion of the effects of perceived risk and perceived seriousness are spurious. It would appear that individuals who perceive themselves as being vulnerable to criminal victimization also may tend to view more incivility and crime and thus, become fearful.

In summary, the results of this section provide partial support for the vulnerability argument. Individuals who are fearful of crime are more likely to perceive greater risk

TABLE 22
FINAL REGRESSION MODEL

	(1)	(2)
DEMOGRAPHIC VARIABLES		
SEX	0.4853*	0.4306*
AGE-SQUARE	0.0001	0.0001
AGE	-0.0023	-0.0027
INCOME-SQUARE	0.0001	0.0002
INCOME	-0.0130**	-0.0134**
RACE	0.2101*	0.1857**
NEIGHBOURHOOD INDICES		
CRIME RATE-SQUARE	-0.0029**	-0.0026
CRIME RATE	0.1771*	0.1629*
INCIVILITY	0.1640*	0.1210**
CONCERN	0.4265*	0.3797*
INTERACTION TERMS		
RACE X CRIME RATE	-0.0951*	-0.0876*
KNOWLEDGE		
VICTIM-ROBBERY/ASSAULT	0.0846	0.0484
VICTIM-BURGLARY	0.1600**	0.1363**
OTHER-ROBBERY/ASSAULT	0.0849	0.0679
OTHER-BURGLARY	0.0236	0.0181
PERCEIVED VULNERABILITY		
RISK	-	0.1203*
SERIOUS	-	0.0665*
R-SQUARE	0.4165	0.4294

*SIGNIFICANT AT P < 0.01.
*SIGNIFICANT AT P < 0.05.

and more severe consequences of victimization. Perceived vulnerability partially accounts for fear among women, blacks and the poor, but does not explain fear of crime among the elderly. These measures also account for some of the fear among those with access to crime information. Individuals with access to crime information perceived themselves at higher risk but were not more likely to perceive more severe consequences of victimization. Finally, perceived vulnerability also partially accounts for fear among those who reside in high crime neighbourhoods and who perceive social disorder and/or crime as being problematic in the neighbourhood.

D. Conclusion

The findings of this chapter provide support for hypothesis 2. Individuals who perceive themselves as being vulnerable to crime tend to be fearful.

The results of the data analysis only provide partial support for hypothesis 3. Perceived vulnerability plays a limited role in explaining fear of crime among the more fearful groups in society. Perceptions of risk and seriousness did explain some of the fear experienced by women, blacks and the poor. However, these measures failed to account for the fear experienced by elderly respondents. The main reason is that the relationship between age and fear in the literature may be greatly exaggerated. Age is only weakly associated with fear.

Perceived vulnerability does partially account for the fear experienced by those with knowledge of criminal events. However, it is perceived risk not perceived seriousness of victimization that determines fear of crime among those with access to crime information. Moreover, measures of perceived vulnerability account for some of the fear experienced by residents of high crime neighbourhoods and among those who express concern about crime and incivility in the neighbourhood. However, a considerable proportion of the effects of perceived vulnerability is spurious. Individuals who perceive themselves as being vulnerable to crime may tend to see more crime and social disorder in the community and thus, become more fearful of crime.

VI. CONCLUSION

A. Summary of Findings

The original goal of this research project was to assess whether perceptions of vulnerability actually contribute to fear of crime. Skogan and Maxfield's model was extended to include measures of perceived vulnerability. According to this revised model, perceptions of vulnerability would provide a causal explanation as to why certain groups are more fearful of crime.

In chapter 2 I have attempted to show that past research which assessed the plausibility of the vulnerability thesis has been deficient. One serious problem with many of these studies has been the use of demographic variables (sex, age, race and income) as measures of vulnerability. The use of demographic variables only begs the question of the vulnerability thesis. What is required are intervening variables that captures differences in vulnerability among the different demographic categories.

Several researchers recognized this problem and introduced other measures of vulnerability such as health measures as determinants of fear. However, these researchers seem to suggest that vulnerability is a concept that is generalizable to all situations. This is problematic since being in poor health does not necessarily mean that people will perceive themselves as being more vulnerable to criminal victimization.

One solution to this problem is to introduce crime related measures that capture differences in perceptions of vulnerability among the more fearful groups. Based upon the fear of crime literature, two types of indicators were introduced to Skogan and Maxfield's model as measures of perceived vulnerability: (1) perceived risk and (2) perceived seriousness of the consequences of criminal victimization.

There has been some evidence in the literature that women, the elderly, blacks, and the poor perceive themselves as being at higher risk of criminal victimization. Moreover, perceptions of risk have been reported to be higher among those who live in high-crime neighbourhoods and those who perceive social disorder and/or crime as neighbourhood problems. Research evidence also suggests that the perceived seriousness of the consequences of victimization may be an appropriate measure of perceived vulnerability. Although researchers have argued that the consequences of victimization may be more severe for women, the elderly, blacks and the poor, no studies were found that attempted to link perceptions of the seriousness of victimization with fear of crime. If measures of perceived risk and perceived seriousness were found to capture key differences in fear among the more fearful groups, then the vulnerability thesis would gain some credibility.

Chapter 3 provides some information about the data and the type of analysis used in this project. Data are from the

Chicago Metropolitan Area Survey. This survey was conducted in the summer of 1979 and includes many of the key determinants of fear described in the model, especially measures of perceived vulnerability. Crime related measures were available for assault, robbery and burglary. This distinction is important since there has been evidence to suggest that it is the personal offenses rather than property crimes that are more likely to influence fear of crime.

Since the major assumption of this thesis is that perceived vulnerability acts as an intervening variable in the relationship between the demographic variables, neighbourhood characteristics and knowledge variables, some method is required to hold the effects of these independent measures constant so that the overall influence of perceived vulnerability can be determined. The simplest method is to use multiple regression analysis. If perceived vulnerability does act as an intervening variable, the slopes of the other independent variables would be substantially reduced when measures of perceived risk and perceived seriousness are added to the model.

Chapter 4 contains the results of the data analysis. Support was found for hypothesis one that women, the elderly, blacks, and the poor are more fearful of crime than their counterparts. Individuals with knowledge of criminal events, residents of high-crime neighbourhoods, and those who perceive social disorder and/or crime as problems in the

neighbourhood also tend to be more fearful of crime.

Having knowledge of criminal events did not account for fear of crime among women, the elderly, blacks and the poor. The demographic variables, sex and age, were found to suppress the effect of being a victim of a personal crime. Being a victim of a personal crime was positively associated with fear. That is, victims of personal crimes express greater fear of crime than non-victims. Men and younger respondents are more likely to be victimized than their counterparts; yet women and the elderly report greater fear. These relationships suppress the effect of personal victimization on fear of crime.

Neighbourhood characteristics provide important causal explanations as to why certain groups are fearful of crime. People who live in high-crime neighbourhoods and who see crime and related phenomena as characteristic of their neighbourhoods are naturally more fearful than those who live in low-crime neighbourhoods and who see their neighbourhoods as benign. However, the effect of neighbourhood crime rates on fear is much more pronounced for whites than for blacks. Consequently, while blacks are more fearful than whites in low-crime neighbourhoods, whites are more fearful in high-crime neighbourhoods. These neighbourhood characteristics also provide important causal explanations as to why the elderly and the poor are more fearful. Elderly respondents are fearful since they perceive more social disorder in their neighbourhood. Concern about

crime and social disorder in the community accounts for fear among the poor and among those with access to crime information. Finally, although women express greater concern about crime, neighbourhood indicators used in this study failed to explain the bulk of the sex difference in fear.

Consistent with hypothesis 2, this study has shown that individuals who perceive themselves as being more vulnerable to criminal victimization are more fearful of crime. Moreover, it is perceived vulnerability to the personal offenses that contributes to fear of crime. Individuals who perceive greater risk and/or more severe consequences of victimization tend to be more fearful.

The findings of this provide some support for hypothesis 3. Perceived vulnerability explains some of the fear experienced by the more fearful groups. Compared to their counterparts, women, blacks, and the poor perceive greater risk and more severe consequences of victimization, and thus, became more fearful. However, perceived vulnerability failed to account for the age difference in fear. There is no age difference in perceived risk. This suggests that the threat of victimization may affect all groups similarly. The elderly were more likely to perceive more severe consequences of victimization, but this did not necessarily imply that they are more fearful of crime. The relationship between age and perceived seriousness was not strong enough to explain even the weak relationship between age and fear.

Perceived vulnerability partially explained fear among those with access to crime information. Victims and those with knowledge of other victims tend to perceive themselves at higher risk, and thus were fearful. However, those with access to crime information were no more likely to perceive severe consequences of victimization than those who were unaware of crimes. This finding is consistent with those of Skogan (1987) who suggests that having access to crime information may have an equal impact on all groups of victims.

The data analysis shows that a considerable proportion of the effects of perceived vulnerability on fear are spurious. Although perceived vulnerability accounts for some of the variation in fear among those who were concerned about crime and social disorder in the community, these neighbourhood indicators also acted as an intervening variable between perceived vulnerability and fear. That is, individuals who perceive themselves as being vulnerable to crime also saw more crime and social disorder in their neighbourhood, and thus were more fearful.

B. Discussion of Findings and Suggestions for Future Research

The results of this study show that measures of perceived vulnerability used in this study explain only a small proportion of the variation in fear among the more fearful groups. This does not necessarily discount the

vulnerability argument altogether. The indicators of perceived vulnerability used in the study may not be sensitive enough to capture differences in vulnerability among the more fearful groups.

The need for better measures of vulnerability become apparent when examining possible reasons why the model failed to explain fear of crime among women. The sex difference in fear may reflect a more fundamental sense of vulnerability among women. Riger et al. (1978) reported that fear of crime among women may lie in their smaller physique. Women who tend to see themselves as least able to defend themselves against attack tend to report greater fear of crime. These physical differences between men and women may be magnified since unlike men, fighting and self-defense are not part of the female sex role socialization process.

Another explanation is that fear of crime among women may actually be the fear of rape (Warr 1984, 1985; Gordon et al., 1980; Riger et al. 1978). Rape usually involves serious emotional and physical damage, and women are usually the exclusive victims of this offense. If rape was included in the list of offenses considered in this study, it may be that perceived risk and the perceived seriousness of this offense may have accounted for the sex difference in fear.

The results of this study also suggest that the major task confronting researchers may be the development of a distinct conceptual framework to explain the sex-difference in fear. The fact that the model failed to explain a large

proportion of fear among women indicates that variables which explained fear among blacks, the poor and the elderly does not substantially account for the sex difference in fear. Researchers would benefit by redirecting their focus from developing a general model of fear towards developing a specific model to explain fear of crime among women.

According to this study, the relationship between age and fear may be greatly exaggerated. Compared to all other demographic variables, age explained the least amount of the variation in fear. This finding was surprising given the amount of research directed towards explaining fear of crime among the elderly.

Several reasons exist why researchers may have failed to detect this weak relationship. First, many researchers have assumed that age and fear are inversely related, and have studied fear of crime among the elderly in isolation without including other reference groups (Clarke and Lewis, 1982; Yin, 1982, 1985; Giles-Sims, 1984; Eve and Eve, 1984; Eve, 1985; Kennedy and Silverman, 1985; Akers et al., 1987). In doing so, these researchers are able to draw conclusions on why some of the elderly are more fearful but not why the elderly are more fearful than other groups. Second, other researchers failed to use multivariate techniques in studying fear of crime and have used bivariate or univariate methods (Tossland, 1982; Yin, 1985; Gomme, 1986). The findings of this study indicate that a considerable proportion of the variation in fear among the elderly is due

to the relationship between age with income and sex. The elderly population includes a disproportionately large number of women and, as a group, are concentrated in the lower income bracket. By not incorporating multivariate techniques, these researchers may have failed to find that these differences accounts for a substantial proportion of fear among the elderly.

Because this research project overcomes some of these problems by including different reference groups and by using multivariate techniques, the results of this study may be more representative of the true relationship between age and fear. Further research should be conducted to determine whether the weak relationship between age and fear is unique to Chicago or whether this relationship is generalizable to other populations.

The findings of this project suggest that further work needs to be taken in evaluating the relationship between the actual consequences of victimization and fear. The literature suggests that women, the elderly, blacks and the poor are more vulnerable to criminal victimization, and thus, are more fearful of crime. However, unless these groups actually perceive themselves as being more vulnerable to crime, it is highly unlikely that they will be fearful. The data analysis show that members of these groups with access to crime information are likely to perceive greater risk but not more severe consequences of victimization. This study provides support for Skogan's (1987) argument that

researchers have misspecified the relationship between the consequences of victimization and fear. In his study, victims were more fearful than non-victims regardless of age, sex, race and income differences. Consistent with Skogan's findings, the results of this study suggest that victimization may have an equal impact on all groups of victims.

The fact that all neighbourhood indicators are significant in the final model suggests that other intervening variables need to be included in the model. Baker et al. (1987) suggest that measures of confidence in the police should be included in the fear of crime model. They report that in high-crime neighbourhoods elderly respondents were less fearful of crime since, as a group, they have more confidence in the police.

It is beyond the scope of this analysis to go into depth on how people may develop their impressions of how problematic crime and/or social disorder are in their neighbourhood. People do hear police sirens, talk to neighbours and friends and listen to the media. Other variables which may affect neighbourhood perceptions may be the types of crimes that are occurring in the respondent's neighbourhood. The fact that burglary victimizations remained significant in the final model suggests that the location of the known offense may also be an important variable in explaining fear. As suggested by Skogan (1987), known burglaries are more likely to occur within the

respondent's own neighbourhood than in other areas of the city.

Another variable which may add to this research project is the familiarity with people in the neighbourhood. Individuals who are more familiar with neighbours are less likely to view them as threatening. This familiarity may have other implications as well. Individuals may feel that neighbours can be relied on for assistance. This would suggest that the greater the intensity and frequency of social contact, the lower the fear of crime.

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